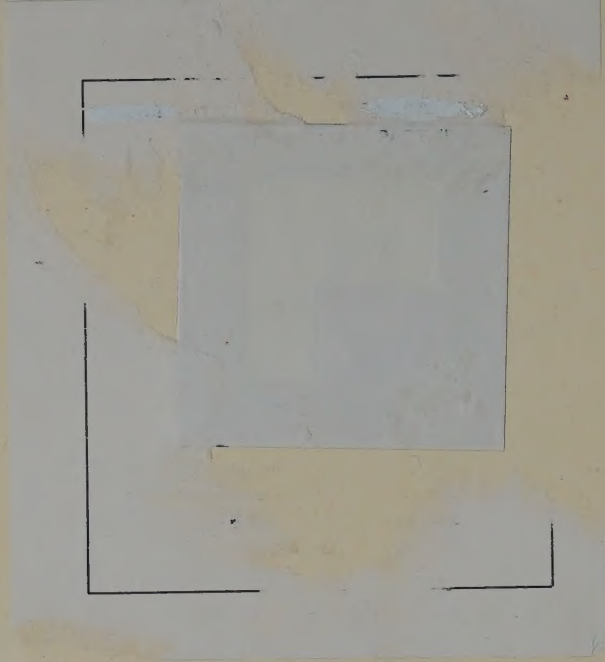




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The Victoria History of the
Counties of England

EDITED BY WILLIAM PAGE, F.S.A.

A HISTORY OF
KENT

VOLUME I

THE
VICTORIA HISTORY
OF THE COUNTIES
OF ENGLAND
KENT



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HER LATE MAJESTY
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WHO GRACIOUSLY GAVE
THE TITLE TO AND
ACCEPTED THE
DEDICATION OF
THIS HISTORY

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GENERAL ADVERTISEMENT

The VICTORIA HISTORY of the Counties of England is a National Historic Survey which, under the direction of a large staff comprising the foremost students in science, history, and archæology, is designed to record the history of every county of England in detail. This work was, by gracious permission, dedicated to Her late Majesty Queen Victoria, who gave it her own name. It is the endeavour of all who are associated with the undertaking to make it a worthy and permanent monument to her memory.

Rich as every county is in materials for local history, there has hitherto been no attempt made to bring all these materials together into a coherent form.

Although from the seventeenth century down to quite recent times numerous county histories have been issued, they are very unequal in merit; the best of them are very rare and costly; most of them are imperfect and many are now out of date. Moreover, they were the work of one or two isolated scholars, who, however scholarly, could not possibly deal adequately with all the varied subjects which go to the making of a county history.

In the VICTORIA HISTORY each county is not the labour of one or two men, but of many, for the work is treated scientifically, and in order to embody in it all that modern scholarship can contribute, a system of co-operation between experts and local students is applied, whereby the history acquires a completeness and definite authority hitherto lacking in similar undertakings.

The names of the distinguished men who have joined the Advisory Council are a guarantee that the work represents the results of the latest discoveries in every department of research, for the trend of modern thought insists upon the intelligent study of the past and of the social, institutional, and political developments of national life. As these histories are the first in which this object has been kept in view, and modern principles applied, it is hoped that they will form a work of reference no less indispensable to the student than welcome to the man of culture.

THE SCOPE OF THE WORK

The history of each county is complete in itself, and in each case its story is told from the earliest times, commencing with the natural features and the flora and fauna. Thereafter follow the antiquities, pre-Roman, Roman, and post-Roman; ancient earthworks; a new translation and critical study of the Domesday Survey; articles on political, ecclesiastical, social, and economic history; architecture, arts, industries, sport, etc.; and topography. The greater part of each history is devoted to a detailed description and history of each parish, containing an account of the land and its owners from the Conquest to the present day. These manorial histories are compiled from original documents in the national collections and from private papers. A special feature is the wealth of illustrations afforded, for not only are buildings of interest pictured, but the coats of arms of past and present landowners are given.

HISTORICAL RESEARCH

It has always been, and still is, a reproach that England with a collection of public records greatly exceeding in extent and interest those of any other country in Europe, is yet far behind her neighbours in the study of the genesis and growth of her national and local institutions. Few Englishmen are probably aware that the national and local archives contain for a period of 800 years in an almost unbroken chain of evidence, not only the political, ecclesiastical, and constitutional history of the kingdom, but every detail of its financial and social progress and the history of the land and its successive owners from generation to generation. The neglect of our public and local records is no doubt largely due to the fact that their interest and value is known to but a small number of people, and this again is directly attributable to the absence in this country of any endowment for historical research. The government of this country has too often left to private enterprise work which our continental neighbours entrust to a government department. It is not surprising, therefore, to find that although an immense amount of work has been done by individual effort, the entire absence of organization among the workers and the lack of intelligent direction has hitherto robbed the results of much of their value.

In the VICTORIA HISTORY, for the first time, a serious attempt is made to utilize our national and local muniments to the best advantage by carefully organizing and supervizing the researches required. Under the direction of the Records Committee a large staff of experts has been engaged at the Public Record Office in calendaring those classes of records which are fruitful in material for local history, and by a system of interchange of communication among workers under the direct supervision of the general editor and sub-editors a mass of information is sorted and assigned to its correct place, which would otherwise be impossible.

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In addition to a general map in several sections, each History contains Geological, Orographical, Botanical, Archæological, and Domesday maps ; also maps illustrating the articles on Ecclesiastical and Political Histories, and the sections dealing with Topography. The Series contains many hundreds of maps in all.

ARCHITECTURE

A special feature in connexion with the Architecture is a series of ground plans, many of them coloured, showing the architectural history of castles, cathedrals, abbeys, and other monastic foundations.

In order to secure the greatest possible accuracy, the descriptions of the Architecture, ecclesiastical, military, and domestic, are under the supervision of Mr. C. R. PEERS, M.A., F.S.A., and a committee has been formed of the following students of architectural history who are referred to as may be required concerning this department of the work :—

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Geology. CLEMENT REID, F.R.S., HORACE B. WOODWARD, F.R.S., and others

Palæontology. R. L. LYDEKKER, F.R.S., etc.

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History of Schools. A. F. LEACH, M.A., F.S.A.

Maritime History of Coast Counties. SIR JOHN K. LAUGHTON, M.A., M. OPPENHEIM, and others

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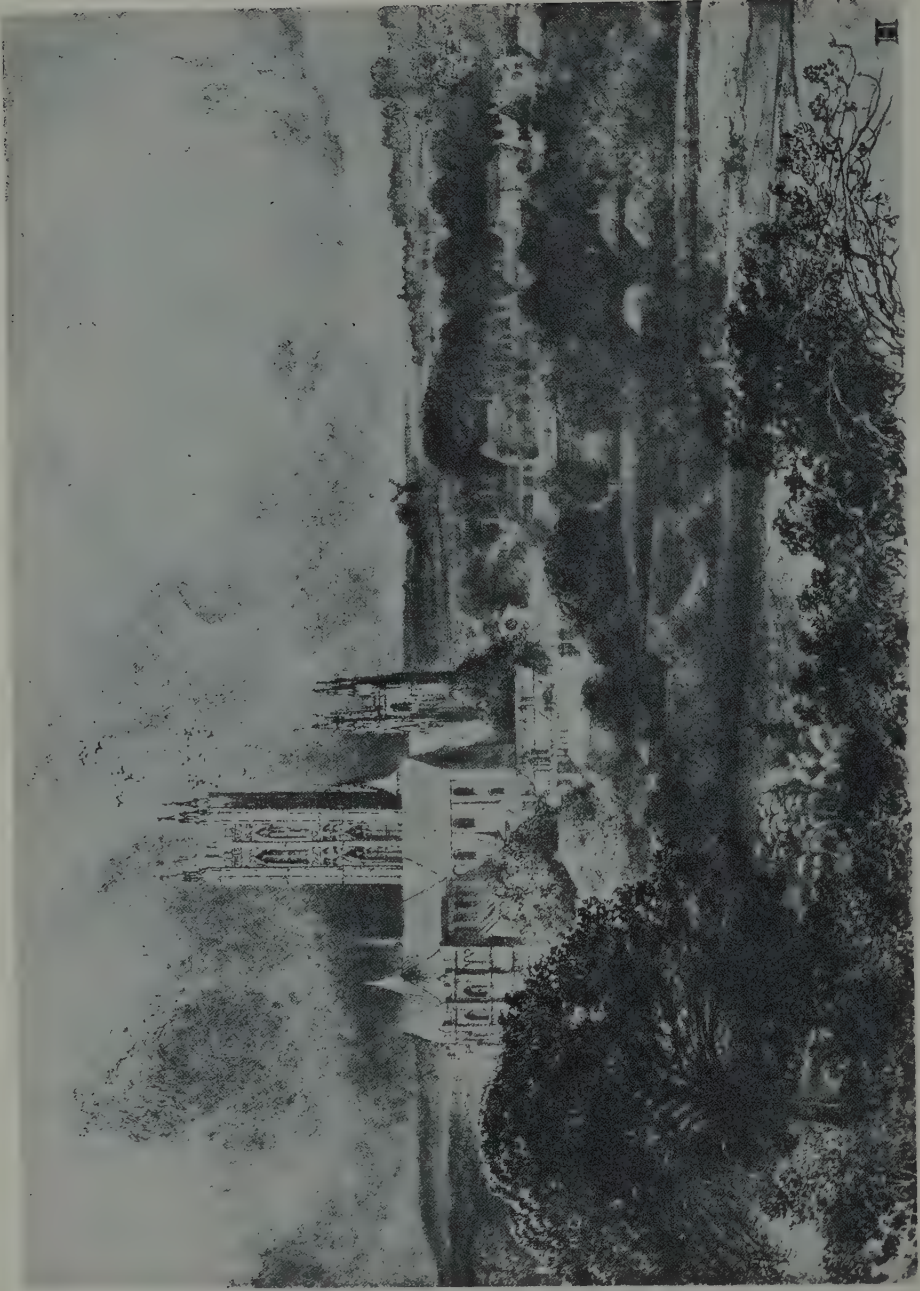
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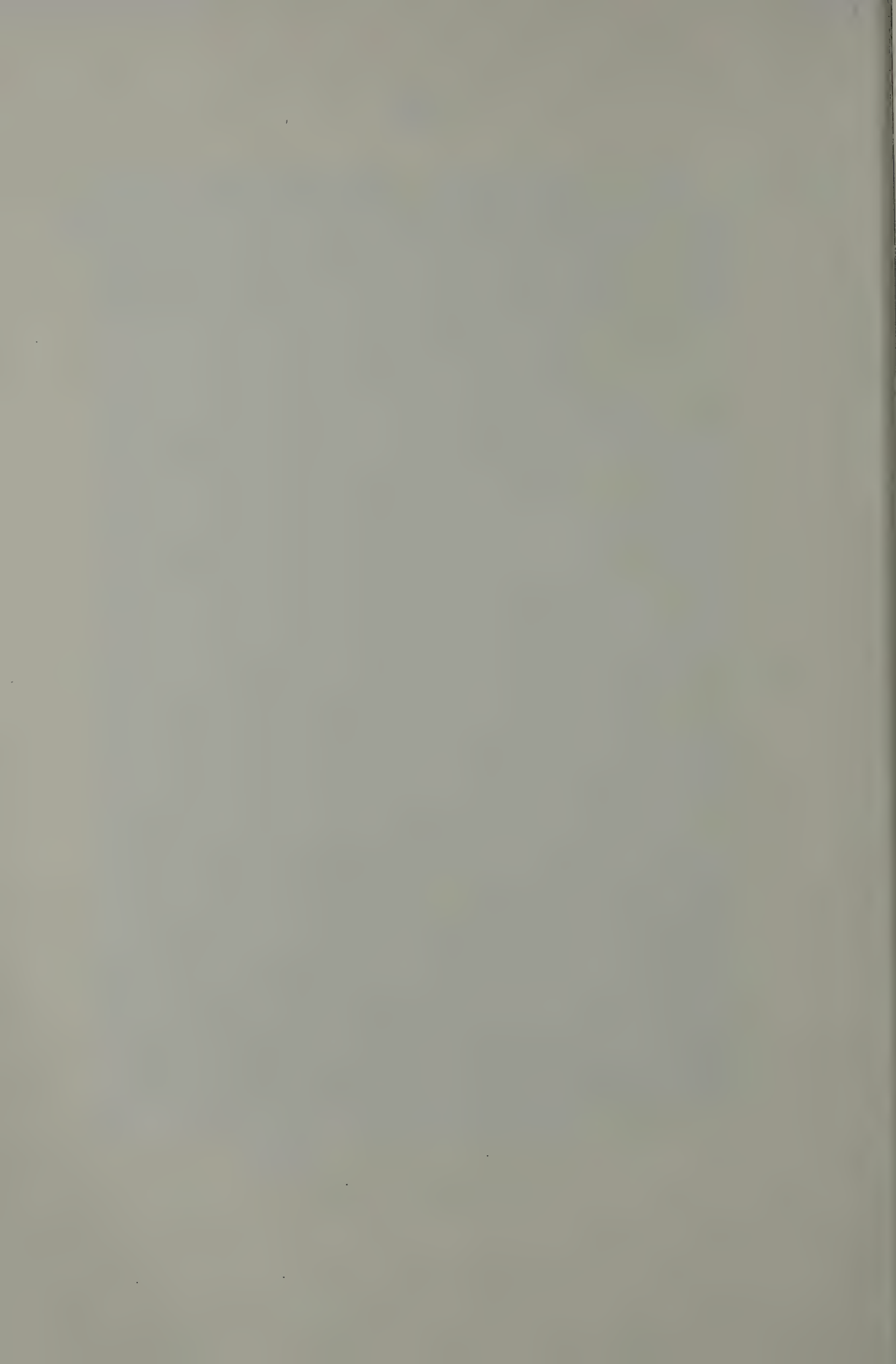
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VOLUME ONE

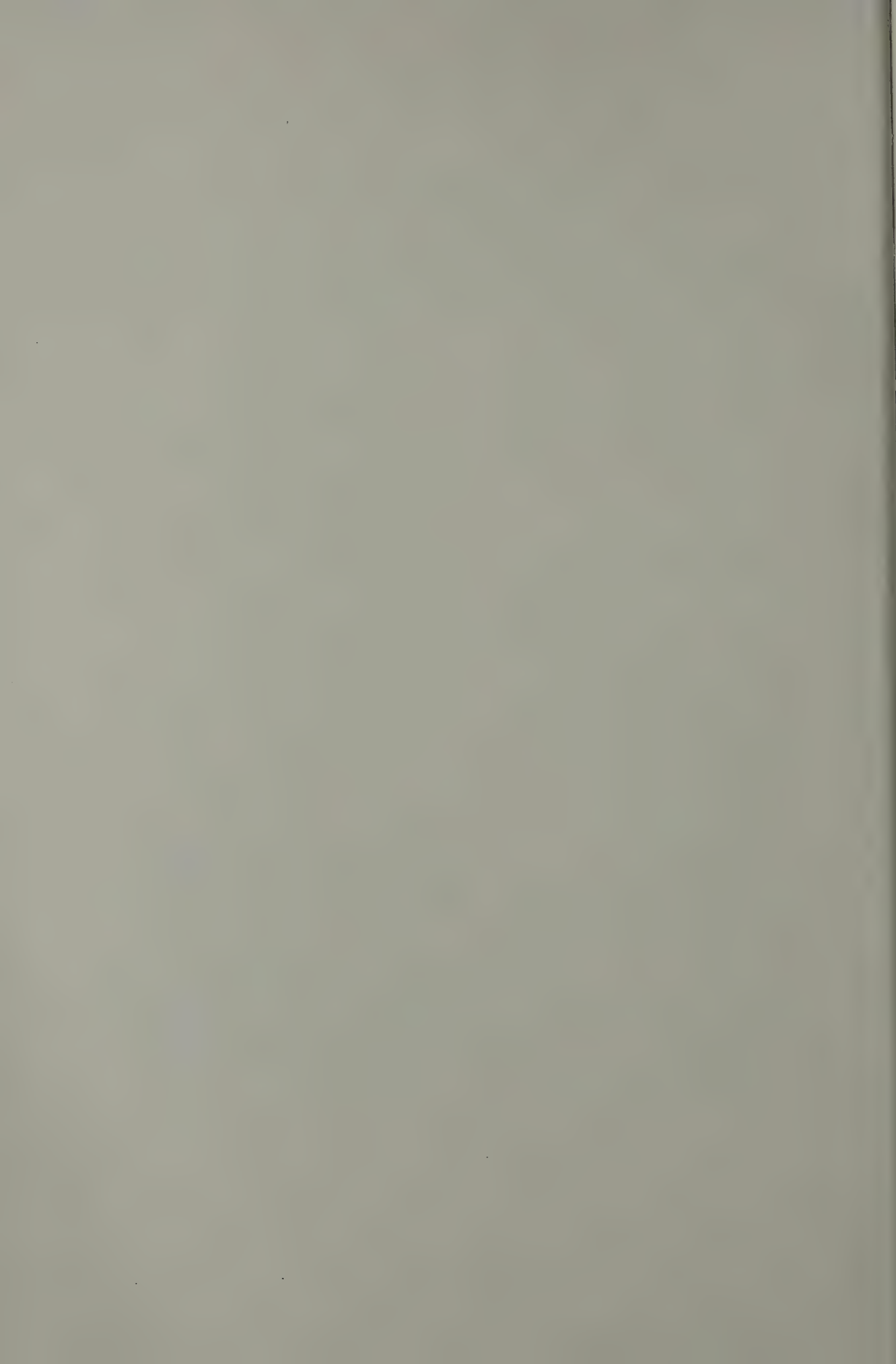
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★ *Not reproduced in this edition owing to technical difficulties*

† *Reproduced in black and white in this edition*

PREFACE

THE history and topography of Kent are so peculiarly attractive that many historians have turned their attention to the county and it has thus been supplied with a continuous flow of topographical works from the sixteenth century to the present day. The first of its historians, and perhaps the earliest English county historian, was William Lambarde, who in 1576 published his *Perambulation of Kent containing the Description, Hystorie and Customes of that Shyre*. Lambarde was born in 1536 and was the son of a draper and alderman of London. He practised law and after publishing some collections relating to the Anglo-Saxon period completed his *Perambulation of Kent* in 1570. This, his principal work, although not quite on the lines of the more modern county histories, gives most quaint and interesting descriptions of old customs which during the period of change in which he lived were fast passing away. After serving the office of Keeper of the Records for some years he died in 1601. Lambarde's work was followed in 1659 by Richard Kilburne's *Topographie or Survey of the County of Kent* and John Philipot's *Villare Cantium*, published by his son Thomas Philipot, but neither of these can well be considered a county history. In 1719 Dr. John Harris, a profuse writer, published a *History of Kent* which, although not of the strictest accuracy, contains much information and is accompanied by a series of plates of great interest by Kyp.

It is however to Edward Hasted that we naturally turn as the historian of Kent. Born in 1732 he was brought up to the law and was a man of considerable property till, like other county historians, his work involved him in pecuniary difficulties. His *History of Kent* was issued in four volumes, the first of which appeared in 1778 and the last in 1799. It is said to have occupied over forty years of his life, and from the care with which it is compiled may be classed among the best of our county histories. It shows an enormous amount of research, particularly among the records of the ecclesiastical corporations which were available to him in the county; but the public records, then distributed in various offices and not easily accessible, are somewhat neglected. A new edition of this history was contemplated by Mr. Henry H. Drake, but only the first volume including the Hundred of Blackheath was completed and published in 1886. It is much fuller in detail than Hasted's work and considerable use has been made of the public records now collected together at the Public Record Office.

PREFACE

Writers such as Charles Seymour, S. Henshall, S. W. H. Ireland, T. Collings and many others have followed with various topographical works on the county, which however can hardly be classed among the county histories of Kent.

This reference to the histories of Kent would be incomplete without mention of the *Archæologia Cantiana*, the publication of the Kent Archæological Society, which was begun in 1858 and contains invaluable records of all matters affecting the history of the county.

The Editor desires to express his acknowledgments to Mr. G. M. Arnold, D.L., F.S.A. and Mr. G. A. Boulenger, F.R.S., F.Z.S. for assistance, and to the Society of Antiquaries, the Kent Archæological Society, Sir John Evans, K.C.B. and Messrs. Longmans, Green & Co. for permission to reproduce illustrations.

Like many others, the Editor deeply deplores the death of Mr. I. Chalkley Gould, F.S.A. whose ever ready assistance on the articles on Earthworks he will greatly miss. Mr. Gould was the first to suggest that articles on this subject should be included in the *Victoria County History*, and always took great interest in and gave much help with regard to them. Fortunately he was able to pass the final proof of the article in this volume a few days before his death.

TABLE OF ABBREVIATIONS

Abbrev. Plac. (Rec. Com.)	Abbreviatio Placitorum (Record Commission)	Charity Inq. . . .	Charity Inquisitions
Acts of P.C. . . .	Acts of Privy Council	Chart. R. 20 Hen. III. pt. i. No. 10	Charter Roll, 20 Henry III. part i. Number 10
Add.	Additional	Chartul.	Chartulary
Add. Chart. . . .	Additional Charters	Chas.	Charles
Admir.	Admiralty	Ches.	Cheshire
Agarde	Agarde's Indices	Chest.	Chester
Anct. Corresp. . .	Ancient Correspondence	Ch. Gds. (Exch. K.R.)	Church Goods (Exchequer King's Remembrancer)
Anct. D. (P.R.O.) A 2420	Ancient Deeds(Public Record Office) A 2420	Chich.	Chichester
Ann. Mon.	Annales Monastici	Chron.	Chronicle, Chronica, etc.
Antiq.	Antiquarian or Antiquaries	Close	Close Roll
App.	Appendix	Co.	County
Arch.	Archæologia or Archæological	Colch.	Colchester
Arch. Cant. . . .	Archæologia Cantiana	Coll.	Collections
Archd. Rec. . . .	Archdeacon's Records	Com.	Commission
Archit.	Architectural	Com. Pleas	Common Pleas
Assize R.	Assize Rolls	Conf. R.	Confirmation Rolls
Aud. Off.	Audit Office	Co. Plac.	County Placita
Aug. Off.	Augmentation Office	Cornw.	Cornwall
Ayloffe	Ayloffe's Calendars	Corp.	Corporation
		Cott.	Cotton or Cottonian
Bed.	Bedford	Ct. R.	Court Rolls
Beds	Bedfordshire	Ct. of Wards . . .	Court of Wards
Berks	Berkshire	Cumb.	Cumberland
Bdle.	Bundle	Cur. Reg.	Curia Regis
B.M.	British Museum		
Bodl. Lib.	Bodley's Library	D.	Deed or Deeds
Boro.	Borough	D. and C.	Dean and Chapter
Brev. Reg.	Brevia Regia	De Banc. R. . . .	De Banco Rolls
Brit.	Britain, British, Britannia, etc.	Dec. and Ord. . . .	Decrees and Orders
Buck.	Buckingham	Dep. Keeper's Rep.	Deputy Keeper's Reports
Bucks	Buckinghamshire	Derb.	Derbyshire or Derby
		Devon	Devonshire
Cal.	Calendar	Dioc.	Diocese
Camb.	Cambridgeshire or Cambridge	Doc.	Documents
Cambr.	Cambria, Cambrian, Cambrensis, etc.	Dods. MSS.	Dodsworth MSS.
Campb. Ch. . . .	Campbell Charters	Dom. Bk.	Domesday Book
Cant.	Canterbury	Dors.	Dorsetshire
Cap.	Chapter	Duchy of Lanc. . .	Duchy of Lancaster
Carl.	Carlisle	Dur.	Durham
Cart. Antiq. R. . .	Cartæ Antiquæ Rolls		
C.C.C. Camb . . .	Corpus Christi College, Cambridge	East.	Easter Term
Certiorari Bdles. (Rolls Chap.)	Certiorari Bundles (Rolls Chapel)	Eccl.	Ecclesiastical
Chan. Enr. Decree R.	Chancery Enrolled Decree Rolls	Eccl. Com.	Ecclesiastical Commission
Chan. Proc. . . .	Chancery Proceedings	Edw.	Edward
Chant. Cert. . . .	Chantry Certificates (or Certificates of Colleges and Chantries)	Eliz.	Elizabeth
Chap. Ho.	Chapter House	Engl.	England or English
		Engl. Hist. Rev. . .	English Historical Review
		Enr.	Enrolled or Enrolment
		Epis. Reg.	Episcopal Registers
		Esch. Enr. Accts. .	Escheators Enrolled Accounts
		Excerpta e Rot. Fin. (Rec. Com.)	Excerpta e Rotulis Finium (Record Commission)

TABLE OF ABBREVIATIONS

Exch. Dep. . . .	Exchequer Depositions	Linc.	Lincolnshire or Lincoln
Exch. K.B. . . .	Exchequer King's Bench	London.	London
Exch. K.R. . . .	Exchequer King's Remembrancer	m.	Membrane
Exch. L.T.R. . .	Exchequer Lord Treasurer's Remembrancer	Mem.	Memorials
Exch. of Pleas, Plea R.	Exchequer of Pleas, Plea Roll	Memo. R.	Memoranda Rolls
Exch. of Receipt .	Exchequer of Receipt	Mich.	Michaelmas Term
Exch. Spec. Com.	Exchequer Special Commissions	Midd.	Middlesex
Feet of F. . . .	Feet of Fines	Mins. Accts. . . .	Ministers' Accounts
Feod. Accts. (Ct. of Wards)	Feodaries Accounts (Court of Wards)	Misc. Bks. (Exch. K.R., Exch. T.R. or Aug. Off.)	Miscellaneous Books (Exchequer King's Remembrancer, Exchequer Treasury of Receipt or Augmentation Office)
Feod. Surv. (Ct. of Wards)	Feodaries Surveys (Court of Wards)	Mon.	Monastery, Monasticon
Feud. Aids . . .	Feudal Aids	Monm.	Monmouth
fol.	Folio	Mun.	Muniments or Munimenta
Foreign R. . . .	Foreign Rolls	Mus.	Museum
Forest Proc. . .	Forest Proceedings	N. and Q.	Notes and Queries
Gaz.	Gazette or Gazetteer	Norf.	Norfolk
Gen.	Genealogical, Genealogica, etc.	Northampt. . . .	Northampton
Geo.	George	Northants. . . .	Northamptonshire
Glouc.	Gloucestershire or Gloucester	Northumb. . . .	Northumberland
Guild Certif. (Chan.) Ric. II.	Guild Certificates (Chancery) Richard II.	Norw.	Norwich
Hants	Hampshire	Nott.	Nottinghamshire or Nottingham
Harl.	Harley or Harleian	N.S.	New Style
Hen.	Henry	Off.	Office
Heref.	Herefordshire or Hereford	Orig. R.	Originalia Rolls
Hertf.	Hertford	O.S.	Ordnance Survey
Herts.	Hertfordshire	Oxf.	Oxfordshire or Oxford
Hil.	Hilary Term	p.	Page
Hist.	History, Historical, Historian, Historia, etc.	Palmer's Ind. . . .	Palmer's Indices
Hist. MSS. Com. .	Historical MSS. Commission	Pal. of Chest. . . .	Palatinate of Chester
Hosp.	Hospital	Pal. of Dur. . . .	Palatinate of Durham
Hund. R.	Hundred Rolls	Pal. of Lanc. . . .	Palatinate of Lancaster
Hunt.	Huntingdon	Par.	Parish, Parochial, etc.
Hunts	Huntingdonshire	Parl.	Parliament or Parliamentary
Inq. a.q.d. . . .	Inquisitions ad quod damnum	Parl. R.	Parliament Rolls
Inq. p.m.	Inquisitions post mortem	Parl. Surv.	Parliamentary Surveys
Inst.	Institute or Institution	Partic. for Gis. . .	Particulars for Grants
Invent.	Inventory or Inventories	Pat.	Patent Roll or Letters Patent
Ips.	Ipswich	P.C.C.	Prerogative Court of Canterbury
Itin.	Itinerary	Pet.	Petition
Jas.	James	Peterb.	Peterborough
Journ.	Journal	Phil.	Philip
Lamb. Lib. . . .	Lambeth Library	Pipe R.	Pipe Roll
Lanc.	Lancashire or Lancaster	Plea R.	Plea Rolls
L. and P. Hen. VIII.	Letters and Papers, Hen. VIII.	Pop. Ret.	Population Returns
Lansd.	Lansdowne	Pope Nich. Tax. (Rec. Com.)	Pope Nicholas' Taxation (Record Commission)
Ld. Rev. Rec. . .	Land Revenue Records	P.R.O.	Public Record Office
Leic.	Leicestershire or Leicester	Proc.	Proceedings
Le Neve's Ind. . .	Le Neve's Indices	Proc. Soc. Antiq. .	Proceedings of the Society of Antiquaries
Lib.	Library	pt.	Part
Lich.	Lichfield	Pub.	Publications
		R.	Roll
		Rec.	Records
		Recov. R.	Recovery Rolls
		Rentals and Surv. .	Rentals and Surveys

TABLE OF ABBREVIATIONS

Rep.	Report	Topog.	Topography or Topographi- cal
Rev.	Review	Trans.	Transactions
Ric.	Richard	Transl.	Translation
Roff.	Rochester diocese	Treas.	Treasury or Treasurer
Rot. Cur. Reg. .	Rotuli Curiaë Regis	Trin.	Trinity Term
Rut.	Rutland		
		Univ.	University
Sarum	Salisbury diocese		
Ser.	Series	Valor Eccl. (Rec. Com.)	Valor Ecclesiasticus (Record Commission)
Sess. R.	Sessions Rolls	Vet. Mon.	Vetusta Monumenta
Shrews.	Shrewsbury	V.C.H.	Victoria County History
Shrops.	Shropshire	Vic.	Victoria
Soc.	Society	vol.	Volume
Soc. Antiq. . .	Society of Antiquaries		
Somers.	Somerset	Warw.	Warwickshire or Warwick
Somers. Ho. . .	Somerset House	Westm.	Westminster
S.P. Dom. . . .	State Papers Domestic	Westmld.	Westmorland
Staff.	Staffordshire	Will.	William
Star Chamb. Proc.	Star Chamber Proceedings	Wilts.	Wiltshire
Stat.	Statute	Winton.	Winchester diocese
Steph.	Stephen	Worc.	Worcestershire or Worcester
Subs. R.	Subsidy Rolls		
Suff.	Suffolk	Yorks	Yorkshire
Surr.	Surrey		
Suss.	Sussex		
Surv. of Ch. Livings	Surveys of Church Livings		
(Lamb.) or (Chan.)	(Lambeth) or (Chancery)		

A HISTORY OF
KENT

GEOLOGY

IF our study of the geology of Kent were to be confined to the strata which constitute the surface only, we should find its rock structure so faithfully reflected in its simple physical features that a knowledge of the shape of the ground would almost necessarily convey an idea of the broader outlines of its stratigraphy. The rising ground south of the Thames, composed of the soft Tertiary clays and sands; the bold range of the North Downs, formed by the Chalk emerging from beneath these and terminating southward in a steep escarpment; the hollow at the foot of this range, where the underlying Gault Clay reach the surface; the lower range of hilly ground running parallel to the Downs, composed of the harder beds of the Lower Greensand, which come next in downward stratigraphical succession; the broad plain south of these hills, underlain by the Weald Clay; and finally the pleasant rising ground along the southern margin of the county, where the sands and sandstones of the Hastings Series emerge from beneath the Weald Clay—all these features of the surface are directly due to the character of the strata and to the direction in which the beds are sloping.

As a glance at the accompanying geological map will show, the different formations extend approximately east and west in more or less continuous belts across the county. They are prolonged beyond its borders in nearly the same direction westward through Surrey and into Hampshire, their course or 'strike' being boldly indicated by the prevalent lie of the hill-ranges.

But our investigation must not be limited to the rocks to which the surface features of the county are due; for we have of late years learnt much regarding the strata buried deeply underground, that have no effect upon the present outline of the land. Indeed our knowledge of the deep-seated geology of Kent has recently made more important advances than that of almost any other part of the British Islands, in consequence of a series of deep borings carried down in search of coal, which have given definite information as to the downward succession of the strata to a great depth.

Thus, of the three main divisions adopted for the fossiliferous rocks in the geologist's time-scale, the beds occurring at the surface in Kent represent portions only of the Cainozoic or Tertiary and of the later part of the Mesozoic or Secondary division. We now know however that the strata beneath the surface range downward to the base of the

A HISTORY OF KENT

Secondary division and embrace portions of the Palæozoic or Primary rocks also. By reference to Table I. on the next page the extent of these additions to our knowledge will be readily grasped.

The geology of the county therefore falls naturally under two heads: (*a*) the study of the outcropping strata and of the features to which they give rise; and (*b*) the study of the deep-seated rocks found only in the borings and having little or no effect upon the outline of the present surface.

It is customary in geological literature to commence with the description of the oldest formation and to work upward through the sequence. But for our present purpose this method is hardly suitable, since the most difficult and technical part of our subject, and that respecting which our knowledge is necessarily restricted, would have to be considered first. The simpler method will be to give precedence to the description of the surface formations of the county in the above-mentioned order, and to discuss the results of the deep borings afterwards under a separate heading.

The tables which follow will serve as indices to the stratigraphical sequence: the first gives a summary of the rock systems commonly adopted as the geological time-scale, with an indication of the portions known to exist in Kent; and the second contains the fuller classification and sub-division of the Kentish strata.

I. SUMMARY OF ROCK-SYSTEMS

Classification	Rock-systems	Relation to Kent
Cainozoic or Tertiary	Recent	Fairly represented
	Pleistocene	Partly represented
	Pliocene	Scantly represented
	Miocene	Absent
	Oligocene	Absent
	Eocene	Widely represented
Mesozoic or Secondary	Upper Cretaceous	Widely represented
	Lower Cretaceous	Widely represented
	Upper Jurassic	Fully represented in deep borings
	Middle Jurassic	Fully represented in deep borings
	Lower Jurassic	Partly represented in deep borings
	Triassic	Scantly represented in deep borings
Palæozoic or Primary	Permian	Not known to exist
	Carboniferous	Upper part proved in two deep borings
	Devonian	Possibly represented in deep borings
	Silurian	Some part certain to exist deep under- ground, and possibly reached in one boring
	Ordovician	
	Cambrian	Unknown
Eozoic Azoic ?	Pre-Cambrian	Unknown
	Archæan	Unknown

GEOLOGY

II. TABLE OF STRATA IN KENT: *a.* STRATA EXPOSED AT THE SURFACE

Period	Formation	Character of Material	Approximate thickness in feet
Recent	Alluvium, Beach-shingle, Blown Sand, etc.	Mud, silt, gravel, etc., at low levels in river-valleys, and marine and estuarine deposits above average high tides	up to 40
Pleistocene	Old River Drift . . 'Superficial' Deposits on the Chalk	Gravel, sand, loam (brick-earth), etc., of ancient river-terraces Clay - with - flints, brick-earth and pebbly loam	up to 45 up to 30 ft. or more in fissures, but thin elsewhere
Older Pliocene	Lenham Beds . . .	Yellow sand and sandy iron-stone	mainly in 'pipes' or fissures of the Chalk
Eocene	Lower Bagshot Beds .	Sand and loam with clay partings (in Isle of Sheppey only)	up to about 20
	London Clay . . .	Stiff blue or brownish clay with nodules of 'cement stone' and pyrites	400 to 480
	Oldhaven or Blackheath Beds	Light-coloured sands and beds of smooth flint pebbles . .	20 to 50
	Woolwich and Reading Beds	Loam, clay, and light-coloured sand, with some flint-pebble beds	up to 50
	Thanet Beds . .	Fine pale sand, often rather loamy, with green-coated flints at base	up to 65
Upper Cretaceous	Upper Chalk . . .	Soft white chalk, with flints .	450
	Middle Chalk . . .	White chalk, with some flints .	265
	Lower Chalk with Chalk Marl	Grey chalk without flints, and calcareous marl	185
	Upper Greensand .	Grey marly sandstone and glauconitic marl	0 to 10 ?
	Gault	Stiff clay, in part marly . . .	120 to 200
Lower Cretaceous	Lower Greensand {	Folkestone Beds .	90 to 110
		Sandgate Beds . .	5 to 80
		Hythe Beds . . .	60 to 180
		Atherfield Clay . .	20 or more
	Wealden {	Weald Clay . .	up to 700
		Tunbridge Wells Sand	150 to 180
		Wadhurst Clay .	160 to 180
		Ashdown Sand .	300 or more

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b. STRATA PROVED IN DEEP BORINGS ONLY

Period.	Formation	Character of Material	Approximate thickness in feet
Upper Jurassic	Purbeck Beds . . .	Clay, shale and cement-stone with gypsum	Very variable; frequently absent; maximum not yet known
	Portland Beds . . .	Sandstone and limestone . .	14 at Brabourne
	Kimeridge Clay. . .	Dark clay and shale, with nodules and bands of cement-stone	up to 356 ft. proved, but maximum not yet known
	Corallian Beds . . .	Coralline and oolitic limestone, etc.	up to 305 ft. proved
	Oxford Clay. . . .	Firm grey marly clay . . .	up to 243 ft. proved
Middle Jurassic	Great Oolite Series. .	Chiefly pale oolitic limestone .	up to 189 ft. proved
Lower Jurassic	Upper, Middle and Lower Lias	Dark shale, marlstone, etc. .	up to 173 ft. proved
Triassic	Trias	Pebble-conglomerate; also 52 ft. red marl and sandstone at Chatham, either Trias or Devonian	48 ft. at Brabourne
Carboniferous	Coal Measures . . .	Sandstone, shale and coal seams	up to 1157 ft. proved
Devonian ?	Doubtful	? Red marl and sandstone of Chatham boring; see above. Dark slaty shale of Brabourne boring (Devonian or older)	up to 52 ft. proved up to 88 ft. proved

THE GEOLOGY OF THE SURFACE ROCKS¹

General Structure.—The predominant factor in the arrangement of the strata forming the surface of Kent is the general northward slope or ‘dip’ of the beds already referred to, by reason of which the older rocks are seen only in the more southerly part of the county and the newer only along its northern margin, every formation in turn sinking north-

¹ The Geology of Kent has a voluminous literature, to which only passing reference can be made in this outline-sketch. For detailed information regarding the stratigraphy of the county the following works should be consulted :—*Memoirs of the Geological Survey* : ‘The Geology of the Neighbourhood of Folkestone and Rye’ (sheet 4 of 1-inch map) by F. Drew (1864); ‘The Geology of the Weald’ by W. Topley (1875), for the beds below the base of the Chalk and for matters connected with the valley systems of the Weald and its denudation; ‘The Geology of the London Basin’ by W. Whitaker (1872), for the Chalk and Eocene; ‘The Geology of London and of part of the Thames Valley,’ vol. i., by W. Whitaker (1889), for later information respecting the Eocene, for account of the River Drifts and other superficial deposits, and for discussion of the deep-seated geology as then known; and vol. ii.

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ward until covered and hidden by the next overlying formation. This rule does not apply however to the Pleistocene and recent deposits—the gravels, sands and clays of comparatively modern origin, often termed the ‘superficial’ beds in contradistinction to the ‘solid’ strata on which they rest; for, as we shall presently see, these are scattered in patches indiscriminately over the whole district. There is also a slight tilt of the ‘solid’ rocks in the opposite direction at the north-eastern corner of the county, by which the beds are bent upwards to the north, so that a shallow trough or ‘syncline’ is formed, wherein Eocene deposits are preserved, with higher ground composed of Chalk on both sides.

To grasp the full significance of the structural arrangement we must look beyond the limits of the county. It will be found that at a short distance to the southward, in Sussex, the northerly dip of the strata ceases to be perceptible; and soon a gentle dip to the opposite quarter sets in, which gradually carries down the older rocks beneath the surface and brings in newer formations the farther southward we go; so that we find the same series of deposits in ascending sequence in a southward traverse across Sussex as in a northward traverse across Kent. The great arch of the strata thus indicated is technically known as the ‘Wealden anticline.’ In their prolongation westward through Surrey and Sussex into Hampshire the corresponding formations on the opposite sides of this anticline curve in towards each other until they meet, so that the successive belts from the Chalk downwards may be followed continuously from the Kentish coast westward and southward around the central Wealden area and then back eastward to the coast of Sussex. Moreover, although on both sides they disappear eastward beneath the waters of the Channel, they are evidently extended under the sea-floor, for they reappear in the same order on the French coast to the northward and southward of Bas Boulonnais; after which, when traced still eastward, the opposite belts soon again converge and join. The Wealden anticline is thus rounded off at both ends, and the central area may be pictured as an elongated dome from which the strata dip away all round. This ‘dome of elevation’ has been so severely planed down and carved out by the long-continued denudation to be presently described, that its very core is now laid bare in south-western Kent and the adjacent parts of Sussex and Surrey. The position of the county on

of the same memoir for details of some Kentish well-sections; ‘The Pliocene Deposits of Great Britain’ by C. Reid (1890), for the ‘Lenham Beds’; ‘The Cretaceous Rocks of Great Britain,’ vol. i., by A. J. Jukes Browne (1900), for the Gault and Upper Greensand; and vol. ii. (1902) by the same author, for the divisions of the Chalk; also ‘Guide to the Geology of London and the Neighbourhood’ by W. Whitaker (ed. 6, 1901), for a brief account of the north-eastern part of the county. The *Memoirs* on ‘the Weald,’ ‘the London Basin,’ and ‘the Pliocene’ contain full bibliographies of the geological literature of these subjects up to the date of their publication; therefore it has not been deemed necessary to give references to the earlier authorities in the present sketch. References to a few important later papers will be found in subsequent footnotes, but for further information as to the more recent literature the reader should consult the *Catalogue of Geological Literature* issued annually since 1894 by the Geological Society of London. The reports of excursions in Kent in *Proceedings of the Geologists’ Association* will also be found useful, both for the descriptions of sections and for the references. The county is embraced in the following maps of the Geological Survey, on the scale of one inch=one mile: Sheets (Old Series) 1, 3, 4 and 6, with very small portions of Sheets 2 and 5.

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the northern slope of the dome is the cause of the general northward dip of its strata. Let us now consider the composition and origin of these strata.

HASTINGS BEDS

The deep borings have proved that for a long period preceding the deposition of the oldest rocks exposed at the surface within the Wealden area, this district was submerged beneath the sea and gradually covered by a great thickness of marine sediments of Jurassic age. But this ancient sea was at length displaced, either by an elevation of the land or by the infilling of its basin, or by a combination of both causes, and the area began to receive the detritus brought down by a large river into a lake or estuary. The freshwater or estuarine deposits of this period constitute the oldest strata visible at the surface in Kent. They occur only in a limited tract in the south-western part of the county, but have a much more extended outcrop south of the county boundary, in Sussex. They consist of a somewhat variable group of sands, soft sandstones, silts and clays, known collectively as the Hastings Beds, which form the lower part of the great freshwater Wealden Series. These beds underlie the pleasant hilly ground to the southward of the flat along which the railway is carried in a nearly straight line from Edenbridge to Ashford; and although their area in Kent is so limited, nearly the whole of the group is represented, owing to the relatively sharp uplift and to the presence of 'faults' or dislocations in this quarter, whereby blocks of strata are shifted to higher levels than they would otherwise occupy.

Ashdown Sand.—The lowest subdivision is the Ashdown Sand, consisting mainly of fine quartzose sand and soft sandstone, with occasional layers of loam and clay and of small well-rounded pebbles. It is well exposed in quarries and road cuttings on the hill immediately south of Tonbridge, being here uplifted by a 'reversed fault' which is visible in the principal quarry. Fossils are rare in this deposit, obscure fragments of plants, washed down from the ancient land, being usually its only relics.

Wadhurst Clay.—Separating the underlying Ashdown Sand from the overlying Tunbridge Wells Sand is the Wadhurst Clay, the most fossiliferous subdivision of the Hastings Beds, and also formerly of considerable economic importance as the chief source of the ironstone which was mined and smelted in the Weald. It consists of alternations of clay, shale and sand-rock, with thin impersistent bands and lenticular nodules of shelly limestone, calcareous sandstone or grit, and clay-ironstone. Its chief outcrops in Kent occur as narrow irregular strips along the valleys of the Medway, Teise, Rother and their tributaries. Its fossils include numerous freshwater shells of the genera *Paludina*, *Cyrena* and *Unio*, with the minute oval valves of *Cypris*, a small crustacean, in vast abundance; and the teeth and bones of extinct fish and reptiles; and the remains of plants. The best collections of these fossils have however been obtained from Sussex, where the gritty layers are sometimes extraordinarily rich

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in reptilian bones and teeth, belonging to the extinct genera *Iguanodon*, *Hylæosaurus*, *Cetiosaurus*, etc.

During mediæval times the ironstone was collected and smelted at many places along the outcrop of the Wadhurst Clay in Kent, as well as in the adjacent parts of Sussex and Surrey; and this industry continued so long as the forests of the Weald were sufficiently extensive to yield a good supply of wood or charcoal for fuel. Traces of the old excavations and of the slag-heaps where the stone was smelted are still visible in many places, as for example on the rising ground between Tonbridge and Penshurst. The fine ironwork railings which were round St. Paul's in London until about thirty years ago were wrought at Lamberhurst on the Kentish border. In the year 1740 there were still four furnaces in Kent, but these had fallen into desuetude before 1788.¹

Tunbridge Wells Sand.—This term is applied to the uppermost subdivision of the Hastings Beds, from the district where it is widely developed. The Tunbridge Wells Sand does not differ much from the Ashdown Sand in general character, its material varying from a fine loamy semicoherent sand, with intercalations of silt and mottled red clay, to a soft thick-bedded sandstone, often with seams of small pebbles in the upper part. In the latter condition it forms the picturesque rocks of Rusthall Common and High Rocks near Tunbridge Wells.

This subdivision occupies the greater part of the tract covered by the Hastings Beds in Kent. It is occasionally sufficiently indurated to be quarried as a building stone, and sandpits are numerous in its softer beds. The soils derived from it are sometimes too 'light' for profitable tillage, and such tracts remain as uncultivated moorland or woodland; but more frequently there is a sufficient admixture of loam and clay to produce fertile arable land at its outcrop. It rarely contains fossils other than fragmentary traces of plants. Like the Ashdown Sand, it is generally a water-bearing formation, the more porous sandy beds being the source of numerous springs; but the water is liable to be slightly chalybeate, as in the well-known springs at Tunbridge Wells.

The Hastings Beds were evidently formed as sandbanks in a lake or estuary by currents of considerable strength, with intervals of stiller water in which the intercalated muds and clays were deposited. The sands are very generally 'false-bedded,' i.e. the original stratification of the component layers has not been horizontal, but has accorded with the slope of the more or less steeply inclined banks into which the sediments were driven. Consequently it is not surprising to find that although the total thickness of the series in southern Kent and Sussex, where the greater part of the material was deposited, exceeds 600–700 feet, it has been proved by the deep borings to thin away very rapidly northward and north-eastward, and is entirely absent in the northern part of the county.

The river-system which transported the sediments forming the Hastings Beds has usually been supposed to have flowed from a land

¹ 'Geology of the Weald,' p. 331.

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lying to the westward and north-westward of the Weald. But this matter will require re-discussion in the light of evidence recently obtained, which seems to point to the principal drainage-area having lain to the eastward.

The method of classification by which the whole of the Hastings Beds are placed in the Lower Cretaceous system, as in the accompanying map and in Table II., though hitherto generally adopted, has lately given rise to much discussion by reason of the Jurassic affinities of many of the fossils. It is indeed probable that the lower part of the series is the freshwater equivalent of marine deposits in other districts which have been classed as the uppermost beds of the Jurassic system. This however is a question of technical terminology into which we need not enter further.¹

WEALD CLAY

The northerly dip soon carries down the Tunbridge Wells Sand beneath the surface in southern Kent; and to the northward the overlying Weald Clay occupies a broad belt of low ground stretching from Romney Marsh on the east to the Surrey boundary on the west, with a width varying from about 4 to 6 miles. This thick mass of clay, with a depth reaching 700 feet or more in the west of the county and increasing to 1,000 feet in Surrey, represents the continuation of the same freshwater conditions that had previously brought about the deposition of the sandy Hastings Beds, though the presence of a few dwarfed oysters here and there in the uppermost layers of the clay,² indicates that brackish water began to find its way into the area toward the close of the period.

This clay represents the muddy detritus from the land, deposited quietly in the deeper and stiller parts of the lake or lagoon. Its great thickness denotes the long-continued prevalence of the freshwater conditions; and also that the lake-floor was sinking gradually during the period, so that the complete infilling of the basin was never effected. Slow subsidence of this kind appears to be in progress at the mouths of many large rivers at the present day, and may perhaps be caused by the gradual depression of the earth's crust by the weight of the sediments accumulated over such tracts.

Since the Weald Clay as a whole overlies the Hastings Beds it has been usually assumed that the full sequence has been successively deposited throughout the Wealden district. But we may here note that the maximum thickness of both divisions is not known to occur in the same area; and after consideration of the evidence from deep borings in Kent and Sussex, and from the field-relations of the equiva-

¹ See Prof. O. C. Marsh, *Geol. Mag.* (1896), dec. 4, iii. 8; A. S. Woodward, *Geol. Mag.* dec. 4, iii. 70; A. C. Seward, *Nature* (1896), liii. 462; and G. W. Lamplugh, *Geol. Mag.* (1900), dec. 4, vii. 443.

² At Hythe in Kent (F. Drew, *Quart. Journ. Geol. Soc.* xvii. 280); also in Surrey (G. W. Lamplugh, in *Summary of Progress of the Geological Survey for 1900*, p. 116) and in the Isle of Wight (*Mem. Geol. Survey, 'Isle of Wight,'* p. 15).

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lent beds in west Sussex and the Isle of Wight, it appears to the writer that part of the sediments classed as Weald Clay in one district may be equivalent to strata classed as Hastings Beds in another part of the Weald. This point is mentioned because of its practical consequence in cases where it is intended to penetrate the Weald Clay by borings for water-supply or other purposes.

The Weald Clay is interstratified at intervals with thin bands of sand and silt, and with layers of limestone made up almost entirely of a freshwater shell of the genus *Paludina*. This limestone, often known as 'Bethersden marble,' from a locality where it was extensively dug, was formerly much used, like the 'Sussex marble' of similar origin, in ecclesiastical architecture, both as a polished stone and unpolished, as for example in the church towers of Headcorn, Smarden, Biddenden and Tenterden, and in the polished altar stairs of Canterbury Cathedral. The fossils of the Weald Clay resemble those of the Hastings Beds, being chiefly freshwater shells and cyprids, with the teeth and scales of fish and the remains of land plants.¹ Where exposed at the surface the clay forms a heavy tenacious soil, expensive and difficult to cultivate. But from its low-lying position much of its outcrop is overspread by alluvium and other superficial deposits, and the tracts thus modified are very fertile and embrace some of the principal hop gardens of the county. The clay itself is dug in many places for brickmaking. Deep borings have shown that this division undergoes the same rapid diminution in thickness in its northward underground extension as the Hastings Beds, and that it thins out entirely before reaching the north-eastern border of the county.²

LOWER GREENSAND

The invasion of the sea, of which, as already noted, there are slight preliminary indications in the brackish water fauna towards the top of the Weald Clay, appears to have become suddenly accelerated at the close of the Wealden period, so that the long prevalent freshwater conditions were abruptly terminated and the whole district submerged beneath the tides of an encroaching ocean. The marine conditions thus established were thenceforward persistent throughout the remainder of the Lower Cretaceous and the whole of the Upper Cretaceous times. During the first stages of this great period of submergence the Atherfield Clay and Lower Greensand were deposited; afterwards the Gault Clay and Upper Greensand; and finally the thick white mass of the Chalk. Minor oscillations of level during this long submergence were frequent, rendering the sea now deeper and now shallower, and the coast-line sometimes near and sometimes more remote; and thereby causing modification or change of character in the sediments. Indeed it is probable that during the earlier stages the shore at times approached within the northern limits

¹ For description of the scanty vertebrate remains of the Kentish Wealden, see subsequent article 'Palæontology,' p. 31.

² See subsequent records of deep boring-sections, pp. 25-8.

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of the county; but in the south the sea never lost its grip of the district nor ceased to build up the framework of the present land.

Atherfield Clay.—The first deposit of this sea was the Atherfield Clay, so named from a locality on the coast of the Isle of Wight where it is typically exposed, a brown or greenish blue clay, somewhat sandy in places, containing numerous marine fossils such as *Ammonites*, *Nautilus*, *Exogyra* (an extinct oyster) and many other shells, with small crustaceans, fish teeth and other remains.

Owing to its soft perishable material, its comparatively slight thickness, and the position of its outcrop on steep foundering slopes capped by the harder overlying strata, it is rare that natural sections of this clay are visible in Kent, though it was passed through in the railway tunnel at Sevenoaks, and was in part recently exposed by artificial excavations near the railway station at Hythe and at Basteard Mills near Plaxtole. The mining shafts at Dover have however provided the most favourable opportunity for studying this deposit in Kent; its thickness here was 40 feet, the clay yielding large numbers of the characteristic fossils, and its base resting with a sharp line of demarcation upon the Weald Clay.

Hythe Beds.—As shown in Table II., the term Lower Greensand is generally extended to include the Atherfield Clay as well as the overlying sandy deposits, but is more strictly applicable to the latter. It has reference to the prevalence of disseminated grains of glauconite, a green silicate of iron, in the series. Near the surface however this mineral is usually decomposed by weathering, giving rusty red or yellow tints to the sandy rocks. These deposits, being less readily erodible, form bold terraces or 'features' at their outcrop; fringing the northern border of the low tract of Weald Clay, they constitute most of the rolling country between this lowland and the North Downs, and include much of the pleasantest inland scenery of the county. They represent the accumulations of a shallow current-swept sea at a time when the land was not far distant. The series is admirably exposed where intersected by the present coast in the cliffs between Folkestone and Hythe, and the names of its subdivisions are founded on these sections.

The Hythe Beds, which constitute the lowest subdivision above the Atherfield Clay, are composed of irregular alternations of slightly loamy glauconitic semi-indurated sand ('hassock') and hard sandy limestone. These harder beds, known as 'Kentish Rag,' are extensively quarried for building purposes and road mending at Hythe, Maidstone, Sevenoaks and other places. They are frequently associated with thin layers of chert, representing the nodular concentration of silica derived from the tiny spicules composing the netted framework of the sponges that lived on the old sea-floor. This chert, which is especially valued as a road material, is most abundant in the upper part of the division on the high ground south-west of Maidstone. Fossils are occasionally abundant in the Hythe Beds, though rare in many localities. At Hythe the series has yielded many echinoderms, *Ammonites* of several species, *Nautilus*, *Belemnites* of

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a species useful in determining the foreign equivalents of the 'zone,'¹ *Exogyra*, *Trigonia*, and many brachiopods and other shells, besides some interesting reptilian bones; while at Maidstone also they have yielded some fine remains of the *Iguanodon*, now in the British Museum, and other extinct reptiles,² along with fragments of wood and coniferous fruits.

In the higher portion of their outcrop west of the Medway the Hythe Beds carry large stretches of woodland and common land, including Westerham Common and Brasted Chart, Whitley Scrubs, Knole Park, Great Comp, Mereworth and East Malling Woods; but east of the Medway their surface is generally very fertile and highly cultivated, supporting many of the best hop and fruit gardens of the Maidstone district.

Sandgate Beds.—The middle subdivision of the Lower Greensand, the Sandgate Beds, consists of dark shaly pyritous clay and muddy glauconitic silt or fine sand, having a thickness of about 80 feet on the coast between Folkestone and Sandgate, where it attains its maximum development. Westward these beds thin away or lose their distinctive clayey character, so that at Maidstone they are represented by only about 14 feet of strata, and a little farther to the west they cease to be recognizable as an independent division. They are very sparingly fossiliferous except in a nodular phosphatic band at their base, which has yielded many brachiopods and other shells.³ Their narrow outcrop is generally marked by the presence of small springs, where the water percolating through the overlying sands is arrested and thrown out by these clayey beds. The destructive landslip which occurred at Sandgate in 1893 was due to the foundering of these beds along their seaward outcrop during a wet season, owing mainly to the action of percolating water.⁴

Folkestone Beds.—As developed in the coast section, the Folkestone Beds, which constitute the uppermost division of the Lower Greensand, are composed of clean-washed light-coloured sands with irregular layers of sandy limestone and cherty seams ('Folkestone Stone'), and darker clayey sand and sandstone at the base, having a total thickness of about 90 feet. Minute siliceous sponge spicules are still recognizable in some of the stony layers, and their presence explains the origin of the chert. The extinct oyster *Exogyra* is plentiful in some of the beds, and the remains of echinoderms, etc., and casts of large ammonites in others, but fossils are not abundant except near the base and again in a band of phosphatic nodules which occurs at Folkestone 3 or 4 feet below the top of the division. The characteristic fossil of the last-mentioned band is *Ammonites mammillatus*, and as this species is found in France in a well-marked zone at the base of the Gault, it has been suggested

¹ See *Summary of Progress of the Geological Survey for 1897*, p. 129.

² For description of these reptilian and other vertebrate remains from the Hythe Beds, see subsequent article 'Palæontology,' p. 31.

³ See F. G. H. Price, 'On the Lower Greensand and Gault of Folkestone,' *Proc. Geol. Assoc.* (1875), iv. 135.

⁴ See W. Topley, 'The Landslip at Sandgate,' *ibid.* (1893), xiii. 40, and *Geographical Journal*, April, 1893.

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that the uppermost portion of the Folkestone Sands should be classed with the Gault.¹

In their prolongation inland the stony bands of the Folkestone Beds soon disappear, so that to the westward of Saltwood the division consists for some distance almost entirely of sharp 'false-bedded' sands with irregular lines of ironstone. West of the Medway however, near Ightham, the sands again include impersistent masses of extremely hard glauconitic siliceous stone ('Ightham Stone' or 'Firestone'), and a similar rock was found in the much attenuated Folkestone Beds passed through in the colliery sinkings at Dover.

The coarser sand-grains of the deposit are frequently extremely well-rounded and polished, as though by long-continued attrition in the shifting sandbanks of the current-swept sea floor, and these smooth-worn grains are particularly noticeable in the band containing the phosphatic nodules near the top of the sands. This band probably marks a falling off in the supply of sandy material as the waters became deeper and the shore-line more distant, and foreshadows the approach of the conditions under which the Gault was afterwards deposited. Where unmodified by 'superficial' accumulations, the Folkestone Beds make a thin sterile soil, and such tracts are only partly cultivated.

SELBORNIAN

Gault.—With the deepening and expansion of the sea basin the sand-bearing currents ceased to reach the district, and only the finer muddy material sank through the quiet waters to this part of the sea-floor. This sediment accumulated to form the Gault, a more or less calcareous clay, in which are embedded the beautifully preserved shells and other remains of marine organisms of the period that gladden the heart of the collector who examines the famous section exposed on the coast at East Wear Bay near Folkestone. For the splendour and variety of its fossils this locality is unrivalled in Kent and is scarcely equalled elsewhere in the British Islands.

They include many species of *Ammonites*, *Hamites* and other allied cephalopods, with *Nautilus* and *Belemnites*; bivalve and univalve shells in abundance and of wide variety; crustaceans of several kinds; small corals; many foraminifera; the teeth and bones of fish and reptiles; and a few plant remains.²

Many of the shells still possess their original pearly iridescence, and can be separated from the soft clayey matrix with all their delicate markings and ornamentations intact. Being usually impregnated with iron pyrites however, they decay rapidly when exposed to the weather, so that it is only in freshly-cut sections on the shore or at the foot of the cliff that they can be obtained in good condition. They are more abundant

¹ For recent discussion of this point, with description of the 'zone of *Am. mammillatus*' at Folkestone, see *Mem. Geol. Survey*, 'The Cretaceous Rocks of Great Britain,' i. 43, 73.

² The reptilian and fish remains of the Gault are described in the context: see article 'Palæontology,' p. 31.

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in the lower than in the upper part of the Gault; and the majority of the species are confined to certain 'zones' or bands which represent the thickness of sediment accumulated during the period that successive species flourished in this part of the ancient sea. The demarcation of these life-zones and their comparison with the time-equivalents in other regions have received much careful study.¹

From the coast the Gault, increasing gradually in thickness, stretches inland in a narrow but uninterrupted belt rarely exceeding a mile in width, to the western limit of the county, where it has a thickness of about 200 feet, or nearly twice that of the Folkestone section. Being more perishable than the underlying and overlying formations, its course is marked by a tract of clayey land forming a depression of the surface, bounded by the bold escarpment of the Chalk on the north, and by the rising ground of the Lower Greensand on the south. It is used in several places for brickmaking, and a band of phosphatic nodules at its base was formerly dug at Cheriton near Folkestone for conversion into chemical manure.

Upper Greensand.—The upper part of the Gault at East Wear Bay is a light grey or buff-coloured marl in which fossils are comparatively rare. This is capped by 10 or 15 feet of glauconitic sandy marl, which was originally considered to be the attenuated representative of the Upper Greensand, a division that in Surrey attains a thickness of 150 feet or more. It is now believed however that this glauconitic marl is really the basement bed of the Chalk ('Chloritic Marl'), and that the true Upper Greensand only commences in the extreme west of the county, probably near Brasted, where a firm grey micaceous and siliceous rock resembling the 'Malmstone' of the Upper Greensand of Surrey may be seen beneath the glauconitic sandy marl.² According to this view the upper part of the Kentish Gault passes laterally westward into the Upper Greensand of Surrey, the one representing the calcareous mud and the other the fine silt deposited at the same time on different parts of the same sea-floor. For this reason it is urged that the Gault and Upper Greensand should be linked together as a single formation, for which the term 'Selbornian' is suggested.³ This method of classification has therefore been adopted here; but it must be remembered that in questions of this kind the system of nomenclature employed is of little consequence so long as the actual facts of the stratigraphical arrangement be definitely understood.

CHALK

From the dawn of history to the present day perhaps the best known fact regarding the rock-structure of England has been that the principal part of the framework of Kent is built up of Chalk.

¹ Our knowledge of the fossils of the Gault and their zonal distribution is principally due to the work of F. G. H. Price (*Quart. Journ. Geol. Soc.* 1874, xxx. 342, and monograph, 'The Gault,' separately pub. Lond. 1879); and of C. E. De Rance (*Geol. Mag.* 1868, v. 163). The most recent list of these fossils is contained in the *Mem. Geol. Survey* referred to on the preceding page.

² *Mem. Geol. Survey*, 'The Cretaceous Rocks of Great Britain,' i. 91.

³ A. J. Jukes Browne, *ibid.* p. 30.

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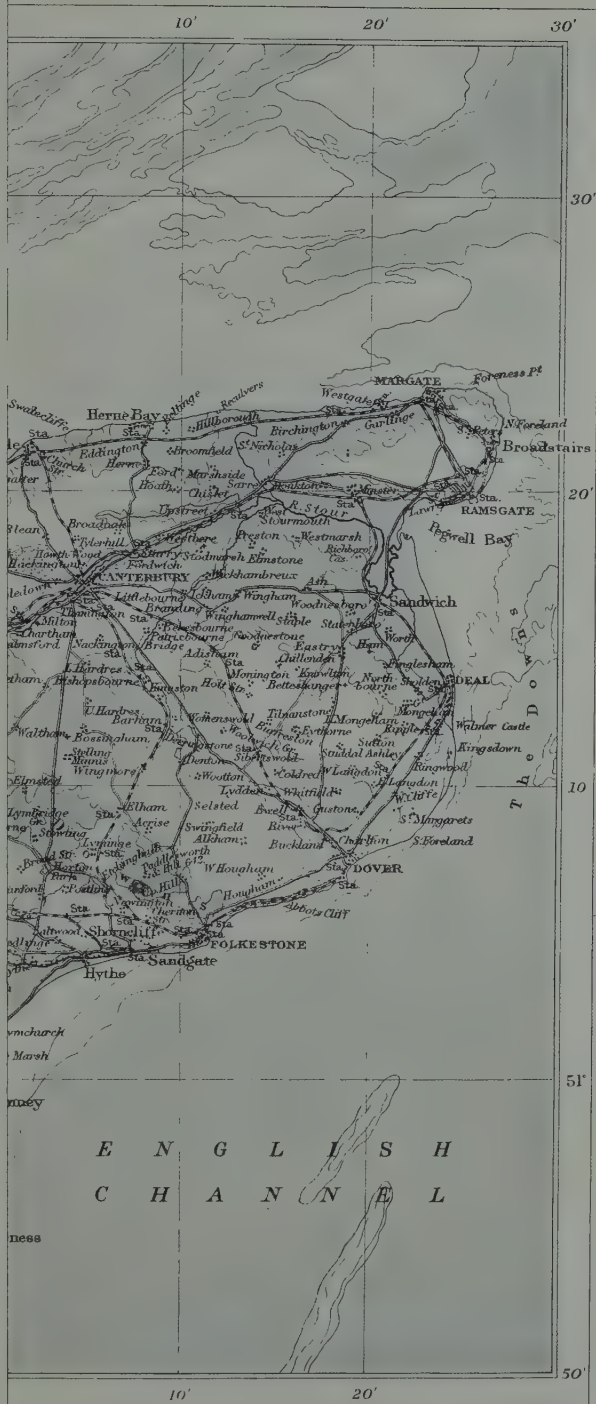
With the great white cliffs of this remarkable formation fronting the Channel at the nearest point of approach of our shores to the continent, in full view of all those who pass through this gateway of our seas, and with the bold scarp of the North Downs, which marks its prolongation into the interior no less conspicuous to the pilgrim by land, no other feature could indeed be more impressively characteristic of the county.

The Downs form the highest ground in Kent, reaching elevations of between 700 and 800 feet in its western part, and 600 to 700 feet farther eastward. These heights are attained close to the steep escarpment in which the Chalk terminates, the surface declining thence gradually northward.

It would be superfluous to describe the general aspect of the formation, but we may dwell for a moment on the remarkably homogeneous composition of the Chalk, which is one of its most extraordinary features. Throughout the whole of its extent in England, from its lowest to its highest beds, with a thickness in some places reaching from 1,000 to 1,500 feet, and from its first appearance in the cliffs of the English Channel to its disappearance in Flamborough Head and the Yorkshire Wolds, this peculiar white limestone preserves everywhere its identity of character, with such minor modifications of structure as become apparent only when the formation is closely studied. It is one of the common-place 'wonders' of geology that this huge mass has been built up almost entirely from the remains of lime-secreting organisms, among which the minute shells of foraminifera are especially abundant. For a period of time which is admitted to have been long even by geological measurement, and by any standard of human history would be reckoned interminable, the calcareous ooze derived from generation after generation of these organisms slowly accumulated on the floor of an open sea, too far from the coast to receive more than an inconsiderable sprinkling of current-borne detritus, and that usually of the lightest. At rare intervals however stones rafted from the land, perhaps by floating ice or entangled in the roots of seaweed or of fallen trees, were dropped to the sea bottom; and are occasionally found in the Chalk, as for example in the neighbourhood of Gravesend,¹ but their occurrence is quite exceptional. Nodules of flint, often occurring abundantly in bands or in tabular masses, are characteristic of a large part of the Chalk and form an integral portion of the deposit. Like the cherts of the Lower Greensand, their material has been mainly derived from the siliceous spicules of sponges, which are known to have flourished in large numbers in the seas of the period.

Subdivisions of the Chalk.—The subdivision of this great mass into Lower, Middle, and Upper Chalk was originally based mainly upon slight differences of composition—the Lower Chalk being usually somewhat grey in colour, marly in its lower portion, and devoid of flints; the Middle division, white and rather flinty in places, sometimes with a hard rock-band (the 'Chalk Rock') at the top; and the Upper Chalk,

¹ *Mem. Geol. Survey*, 'Geology of London,' i. 82.



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white and with many flints in some beds and few in others. But these characters are found to be more or less impersistent when a wide area is examined, and it is now recognized that the fossils afford a more satisfactory basis for classification. During the vast period represented by the Chalk, the fauna inhabiting the sea was steadily changing, most of its species being gradually modified, or extinguished and replaced by others. The shells and other hard parts of many of these organisms were embedded in the slowly accumulating mud of the sea-floor; and by the succession of these fossil species synchronous divisions may be recognized in widely separated districts, even where the enclosing rock-substance has lost its distinguishing peculiarities. On this basis, by a close study of its fossils, the Chalk of Kent has been recently re-classified, divided into 'zones' like the Gault, and correlated zone by zone with the Chalk of other districts.¹ For this purpose the tests of the sea-urchins of the genera *Micraster* and *Holaster*, which along with other genera are among the commonest fossils of the Chalk, have been found especially serviceable; while certain other zones are distinguished by the presence of another echinoderm, *Marsupites*; by the different species of the extinct cuttle-fish, *Belemnitella* and *Actinocamax*; and by species of brachiopods, *Terebratulina* and *Rhynchonella*. Besides the fossils which have been selected as 'zonal' indicators, the Chalk abounds in other organic remains, including sponges of great variety; small corals; a few univalve and many bivalve shells, the latter including characteristic species of *Inoceramus* and *Spondylus*; a few crustaceans; many cephalopods of the genera *Ammonites*, *Scaphites*, *Baculites*, *Nautilus*, etc.; and the teeth, bones and other hard parts of numerous fish and reptiles.²

Owing to the prevalence of a covering of clayey earth, and in part also to the lower average elevation of the hills, the Kentish Downs present a more varied aspect than is usual in Chalk uplands. Instead of a dry thin soil and treeless surface covered only with smooth short turf, the Chalk in this county more frequently sustains a deep productive loam, with cultivated tracts and park-lands in which the beech and other trees thrive well.

The Chalk is extensively quarried in many places, especially along the margin of the Thames valley, for burning into lime and for the preparation of whiting. Mixed with clayey material it is also largely used in the manufacture of Portland cement. As a water-bearing formation its economic importance is very great, the rainfall upon its surface

¹ Dr. A. W. Rowe, 'An Analysis of the genus *Micraster*,' *Quart. Journ. Geol. Soc.* (1899) lv. 494-544; and 'Zones of the White Chalk of the English Coast, pt. 1, Kent and Sussex,' *Proc. Geol. Assoc.* (1900) xvi. 289-368; and 'pt. 2, Dorset,' *ibid.* xvii. 1-76. G. E. Dibley, 'Zonal Features of the Chalk Pits in the Rochester, Gravesend and Croydon Areas,' *Proc. Geol. Assoc.* (1900) xvi. 484-99. The earlier work of Dr. C. Barrois, 'Recherches sur le terrain crétacé supérieur de l'Angleterre et de l'Irlande,' *Mémoires de la Soc. Geol. du Nord*, tome i. (1876), should also be referred to.

² For the latest fossil lists see the papers of Dr. Rowe and Mr. Dibley above quoted and the *Mem. Geol. Survey*, 'The Cretaceous Rocks of Britain, vol. ii. The Chalk' (1902). For description of the numerous vertebrate remains obtained from the Kentish Chalk, see article 'Palæontology,' p. 31.

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sinking rapidly through the pores and crevices of the rock, so that water is stored underground in large quantity, and is obtained in abundance from many deep wells.

Toward the close of the Cretaceous period the ocean which for so long had covered the greater part of the British Islands became diminished in depth and extent by reason of an elevatory movement of this part of the earth's crust, and finally the whole region was brought once more above sea-level. This change, so far as our country is concerned, is indicated by a gap in the geological record, since it is of course only in areas where at any particular period deposits have accumulated that we can read the course of events directly from the stratigraphical evidence. In Kent we can only judge of the great lapse of time between the deposition of the highest beds of Chalk still preserved and of the lowest of the overlying formations, by the fact that in the interval a vast change had taken place in the life-forms, and that every species of the Chalk sea, except perhaps a few microscopic animals of low development, had become extinct and had been replaced by species unknown in the previous epoch. To the marine life of the present time the fossils of the Chalk bear scarcely a trace of specific or even generic resemblance; but those of the immediately overlying Eocene deposits, although still very different, show a distinct and thenceforward increasing relationship with the existing life-forms of our seas.

The floor of the Chalk sea appears to have been elevated so gradually and evenly in the south-east of England that, when it came within reach of the erosive agency of waves and currents, its destruction proceeded at approximately the same rate over wide areas; so that the newer deposits, in part made up from its waste, were spread out upon the worn surface in sheets almost parallel with the stratification of the Chalk itself; and the unconformity of bedding which usually accompanies the junction of rocks which differ considerably in age is rarely noticeable where the lowermost Eocene beds rest upon the Chalk in the Kentish sections.

LOWER LONDON TERTIARIES

When our stratigraphical record is resumed it indicates the existence of a shallow sea with shifting currents, and afterwards marks the approach of the estuary of a large river probably flowing from the westward into this sea. Under these conditions a changeful series of sands and clays with pebble beds was formed, which are collectively known as the Lower London Tertiaries and constitute the lowest group of the Eocene period.

Thanet Beds.—The earliest member of the group is the Thanet Beds, a marine deposit of fine pale-coloured sand, often somewhat clayey or loamy. This, as its name implies, is well developed in the north-eastern part of the county, in the shallow trough or syncline of Chalk between the Isle of Thanet and the North Downs, where it has a thickness of about 60 feet, and is exposed in the cliffs of Pegwell Bay

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and near Reculvers. It ranges thence westward, with slight changes of composition, along the northern slopes of the Chalk up to the Surrey boundary, but dies out gradually in the eastern part of that county. From the relatively insignificant thickness of this subdivision and from the slight resistance which it can offer to the erosive agencies, its outcrop takes the form of a ragged irregular fringe to the Tertiaries, with many detached patches or 'outliers' surrounded by Chalk where the wasting back of its mass has been unequal in rate at different spots. A layer of unworn green-coated flints is constantly found at its base, these having been derived from the Chalk either by the slow solution of the original matrix by percolating waters after the deposition of the sands,¹ or by its removal under gentle current action before their accumulation. The fossils of the Thanet Beds consist mainly of a few marine shells, which are found chiefly in the eastern part of the county and are very rare in the western part. These beds, with the overlying members of the group, may be studied in numerous fine artificial sections in the north-western part of the county,² as for example in the railway cuttings near Chislehurst, where the recent widening of the South-Eastern line has laid open the whole sequence.³

Woolwich and Reading Beds.—Next in the series we find a mass of sediments—the Woolwich and Reading Beds—which represent a period when the northern part of Kent lay at the mouth of a lagoon or estuary, with open sea to the north-eastward. In east Kent the deposits of this period consist of sharp light-coloured false-bedded sand containing a few marine fossils, usually with a greenish clayey layer and rolled pebbles of flint at the base. Farther westward the beds are more variable, light-coloured sands being interbedded with clay and loam and with indurated bands of oyster shells and occasional layers of flint pebbles. These sediments are often crowded with estuarine shells of the genera *Cyrena*, *Unio*, *Corbula*, *Ostrea*, *Paludina*, *Melania*, *Cerithium*, etc., and sometimes contain fragmentary plant-remains. These estuarine beds have been supposed to indicate the existence of a large river flowing from the west, but they have also been explained as representing the deltas of smaller streams flowing northward from the tract now known as the Weald.⁴ The outcrop of the Woolwich and Reading Beds and also that of the overlying Oldhaven and Blackheath Beds border that of the Thanet Sand, and are subject to the same general conditions. It is found however that the overlying division in each case extends in certain places southward beyond the limits of the underlying bed, and then rests directly upon the Chalk. This 'overstep' of the newer upon the older member of the series is held to show that the bounds of the sea were again expanding over a sinking land.

¹ For discussion on this subject and references to literature see *Mem. Geol. Survey*, 'The London Basin,' iv. 58.

² For list of Kentish sections near London see *ibid.* 'Guide to Geology of London and the Neighbourhood,' by W. Whitaker, pp. 38, 43, 47, 57.

³ See *Proc. Geol. Assoc.* (1900), xvi. 523, 533, and (1901), xvii. 69, 136.

⁴ See 'Guide to London,' *op. cit.* p. 40; also *The Building of the British Isles*, by A. J. J. Browne, p. 315.

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Oldhaven and Blackheath Beds.—These beds, now classed as forming the uppermost division of the Lower London Tertiaries, were originally regarded as the 'Basement Bed' of the London Clay.¹ In west Kent they are principally composed of peculiarly well-rolled flint pebbles mixed with fine sand; but in the eastern part of their outcrop, except in an outlier at Shottenden Hill south of Selling, this predominant pebbly character is lost, and they consist of fine light-buff sand with dark grains, and sometimes with thin layers or patches of clay and a pebbly band or a bed of sandy brown iron-ore at the base. The rounded shape of all the pebbles is very characteristic and indicates long-continued attrition of the flints on the Eocene shingle banks. The fossils of the Oldhaven and Blackheath Beds are partly marine and partly estuarine, the marine species predominating in the eastern sandy portion of the formation. Westward the division thins out and disappears soon after crossing the Surrey border.

LONDON CLAY

The deposition of the sands, estuarine muds and shingle beds of the shallow-water Lower London Tertiaries was brought to a close by a subsidence of the land, which carried down the whole district once more beneath the sea and caused the earlier Eocene strata to be over-spread by a deep mass of marine clay—the London Clay—which constitutes the thickest and most widespread division of the Eocene sediments of the London basin. This great bed of tenacious brown and bluish-grey clay, attaining a thickness of from 400 to 480 feet where present from base to summit, preserves the same character over wide areas. It has usually an admixture of sand and flint pebbles in its lowermost stratum, and also contains here and there layers of nodular calcareous concretions, and segregations of pyrites. The calcareous nodules generally show shrinkage-cracks or *septa* lined with calcite or aragonite, and on this account are termed *septaria*; these nodules have been collected in large numbers in the Isle of Sheppey for use in the preparation of cement.

The widest tracts of London Clay lie beyond the boundaries of Kent to the north and west, but a glance at the geological map will show that it also covers much ground in the northern part of our county, lying always within a fringe of the Lower London Tertiaries. In the west it is broken up into numerous outlying patches and spurs, the remnants of a once continuous sheet which has been worn into shreds by denuding agencies. Farther east, though much obscured by the alluvium and other 'superficial' deposits of the Thames and its tributaries, it underlies the Hundred of Hoo and the Isle of Grain; and reappears from beneath the alluvium of the Medway in the Isle of Sheppey, where its uppermost beds are in places preserved, and where it is well exposed in cliff-sections long famous for their numerous and diversified fossils. On the mainland farther eastward it underlies the undulating well-

¹ See *Mem. Geol. Survey*, 'The London Basin,' p. 239.

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wooded tract known as The Blean, extending along the seacoast from Whitstable to a little beyond Herne Bay and inland nearly up to the valley of the Stour, but is frequently covered with patches of Pleistocene gravel, brickearth and loam.

Though rich in fossils, these are unequally distributed, being very numerous in some localities and rare or absent in others. They are essentially marine, but include many remains drifted from the land ; and it is probable that the river of which we had glimpses in the earlier Eocene deposits still continued to pour its burden of land-waste into the sea in this quarter, though its actual estuary now lay at some distance from our district. Hence besides very numerous species of marine fish, molluscs, crustaceans, annelids, echinoderms, corals, etc., the fossils include, in less abundance, the relics of extinct mammals, birds, turtles and crocodiles,¹ along with many plant-remains, chiefly the seeds and fruits which are preserved in a pyritized state. The most prolific locality for these fossils, especially for the plants and vertebrate animals, is the coast of Sheppey, as above mentioned. The climate of the period, as indicated by these fossils, must have been considerably warmer than at present ; and indeed throughout Early Tertiary times the conditions appear to have been such as now only prevail much farther south in our hemisphere.

Lower Bagshot Beds.—Of the events which succeeded the deposition of the London Clay our evidence is meagre and all in shreds and patches. Deposits preserved in Surrey and the country farther to the westward indicate that there followed a gradual change, owing to the re-elevation of the sea floor, so that shallow-water and estuarine conditions once more prevailed in this part of England, whereby sands and pebble beds were spread out over the London Clay. But in Kent, where they may once have existed, these newer Eocene beds have been denuded away, except in the Isle of Sheppey where in a few places the uppermost portion of the London Clay passes upward into sand and loam with clayey partings, supposed to represent the lowest part of the Lower Bagshot Beds of Surrey. The largest of these outliers occurs between Minster and Eastchurch ; it is barely a square mile in extent.

THE MIOCENE ELEVATION

Then follows a long blank in the stratigraphical succession, the remainder of the Eocene and the whole of the Oligocene and Miocene periods having no representatives in our county. Indeed, in no part of England is there any deposit of Miocene age, and the Oligocene is represented only in the ' Hampshire basin,' where there are alternations of marine, estuarine and freshwater strata of this age. We know however that during this long interval great changes in the distribution of land and sea took place throughout Europe, owing to powerful move-

¹ For particulars respecting the vertebrate fauna of the London Clay, see subsequent article 'Palæontology,' p. 31.

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ments of the earth's crust during Miocene times by which huge mountain chains were upheaved in some parts and vast sheets of molten lava poured out over the surface in others. In a minor but still important degree these disturbances affected the whole of the south-east of England, throwing the rocks into broad waves, or buckling them into sharp folds such as may be seen in the cliff-sections of the Isle of Wight and of Dorset.

Although the already-described 'overstep' of the upper beyond the lower divisions of the Lower London Tertiaries indicates that the elevation of the Wealden dome must have begun very early in Eocene times, it was probably under the influence of these great earth-movements of the Miocene period that the principal uplift took place. And as we shall presently see, the form that was then given to the surface is still reflected in the river-systems of the county, which must have been established when the outline of the land was very different from that which it now presents. It was after this elevation that the chiselling of the surface commenced of which the existing relief is the distant outcome.

Once however in the interval between the Miocene uplift and the present time the area must have been temporarily submerged beneath the sea, as the following evidence will show.

PLIOCENE PERIOD

Lenham Beds.—Along the crest of the Downs from the coast above Folkestone to within a few miles of Maidstone, the Chalk is capped here and there with patches of rusty sand sometimes indurated into lumps of ironstone. This material is usually unfossiliferous, but in two or three places the hollow casts of marine shells have been found in the ironstone, and these are sufficient to indicate that the deposit is of Older Pliocene age, equivalent to the Diestian Beds of Belgium and to the lower part of the Coralline Crag of Suffolk.¹ The sands appear originally to have been glauconitic and full of shells, but have been slowly weathered into their present condition by the percolation of surface-water through them; so that were it not for the preservation of the casts in the ironstone, from which it is possible to obtain determinable moulds of the shells,² they would have been devoid of direct evidence as to their age. The principal locality for these fossils is at Lenham, nine miles east of Maidstone, where the sands and ironstone have sunk down into 'pipes' or deep cylindrical holes melted out in the Chalk by the solvent action of the surface drainage in passing along 'water-sinks.' The fauna, which is exclusively marine, comprises species of *Turritella*, *Pyrula*, *Pectunculus*, *Arca*, *Terebratula*, etc., and is believed to indicate a depth of the sea of not less than 40 fathoms during the accumulation of the sands.³

¹ Mr. F. W. Harmer has recently expressed the opinion that the Lenham Beds are slightly older than the Coralline Crag. See *Quart. Journ. Geol. Soc.* (1900), lvi. 708.

² See C. Reid, *Nature* (1886), xxxiv. 341.

³ *Mem. Geol. Survey*, 'Pliocene Deposits of Britain,' p. 52.

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PLEISTOCENE AND RECENT DEPOSITS

The Lenham Beds, with their tantalizingly fragmentary evidence of extensive submergence, are the latest marine deposits of Kent, if we except the low-level shingle of recent accumulation at Dungeness and the estuarine silt of the marshes of the Thames. All the other remnants of its later geological history tell of the long persistent waste of a land surface shattered by winter frosts and torn down by the gathering of the rains and melting snows into streams, or steadily lowered by the solution of its limestones from the percolation of the sub-aerial waters through its pores, each muddy stream and lime-charged spring incessantly carrying its load of particles downward to the rivers, that in turn sank their channels deeper and deeper into the land as they swept powerfully onward to the sea.

The Denudation of the Weald.—Let us now consider more fully the eloquent testimony which these rivers in themselves bear to the vast change that the country has undergone since they began to flow in their present courses. Although the plain of Weald Clay lies open eastward to the sea, the Darent, the Medway and the Stour all flow northward from it to break across the high opposing barriers of the Lower Greensand and Chalk in deep trench-like valleys that they have excavated at right angles to the present escarpments. This behaviour seems inexplicable until we realize the geological conditions by which their courses were originally determined. We must picture to ourselves the shape of the land after the uplift of the Wealden dome, when the Chalk still formed a continuous arch across the interior, of which only the opposite buttresses now remain in the North and South Downs. From this surface the drainage would necessarily flow northward and southward on the opposite sides of the dome, which are precisely the present directions of the principal rivers of Kent on the one side and of Sussex on the other side ; and thus the problem no longer presents any difficulty. Since the courses of these streams were established, the crest of the dome has crumbled away ; formation after formation has been stripped off ; the softer strata have been everywhere lowered relatively to the harder, and longitudinal depressions formed in which tributary streams have been nourished, thereby further accelerating the trenching of the surface ; but still the main rivers have held their original direction and deepened their channels across the broken shell of the land, and they will continue to do so until they have sunk so deeply as to become powerless, or until the country sinks again for renovation beneath the ocean.

Some relics of this period of erosion—mere shreds of waste left scattered here and there for a while until the elements find time to round off their work—will now claim our attention.

Clay-with-Flints and other Hill Drift.—It is in the river valleys that such traces are most abundantly found ; but they are not wanting even on the hills. Thus, as already mentioned, the surface of the Chalk on the Downs, where the ground is not too steep, is very generally over-spread with an irregular sheet, from a few inches to several feet in

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thickness, of loam and reddish-brown clay full of unworn flints, which has accumulated deeply in the little 'pipes' and hollows of the rock and to a less extent on the intervening spaces. It is believed that this 'Clay-with-Flints' represents the insoluble matter remaining from the gradual decay and lowering of the Chalk under the action of surface waters, mixed here and there with a little detritus from Tertiary beds that once existed at higher levels. Occasionally also patches of water-worn gravel are found at high elevations, of uncertain origin but probably the relics of long-vanished streams whose gathering grounds have been carried away by the recession of the escarpments. Great interest has been aroused in these high-level deposits of the Downs¹ by the discovery of large numbers of weathered flints with rudely chipped edges, supposed to be of human workmanship and of older date than the 'Palæolithic' implements found in the gravels of lower levels, and therefore named 'eoliths.' The artificial character of these 'eoliths' is denied by some authorities, and the subject will require further investigation before it can be regarded as settled.²

River Drift.—The older river deposits of the main valleys consist of terraces of gravel, sand and flood-loam or brick-earth, that often occur at levels high above the present streams and mark successive stages in the deepening of their channels. These beds have been carefully studied in Kent, and much has been written regarding them; but space-limits forbid more than a brief mention here of the chief exposures. Below Woolwich, where the Darent joins the Thames, the slopes are bordered by a thick mass of fossiliferous brick-earth, interstratified with sand and gravel, into which large pits have been dug between Erith and Crayford. Besides numerous land and freshwater shells, the remains of mammoth, elephant, rhinoceros, hippopotamus, lion, bear, wolf, hyæna, bison, bos, musk-ox, elk, stag, horse and many smaller animals, including the Norwegian and the Arctic lemmings,³ have been obtained from these excavations,⁴ and also coarsely-chipped Palæolithic flint implements, undoubted relics of ancient man. In one of the pits at Crayford flint flakes were scattered plentifully in a well-defined layer, and this was proved to be an actual working-place of the old implement-makers in chipping flint 'haches,' as in one case when the contiguous flakes were collected it was found possible to replace them in their relative positions so that the outline of the original unworked

¹ The gravels of this district and the age of the flint implements have been discussed in detail by the late Prof. J. Prestwich in the following papers: 'On the Occurrence of Palæolithic Flint Implements in the neighbourhood of Ightham, Kent,' *Quart. Journ. Geol. Soc.* (1889), xlv. 270; 'On . . . a Southern Drift in the Thames Basin . . . ' *ibid.* xlv. 155; 'On the Age, Formation and Successive Drift Stages of the Darent Valley,' *ibid.* (1891), xlvii.; 'Flint Implements of the Chalk Plateau of Kent,' *Journ. Anthropol. Inst.* (1892), p. 24; and in *Controverted Questions of Geology*, London, 8vo (1895), pp. 49–81, etc. See also W. Cunnington, 'On some Palæolithic Implements from the Plateau Gravels, and their evidence concerning "Eolithic" Man,' *Quart. Journ. Geol. Soc.* (1898), lvi. 291.

² For further discussion of these 'eoliths,' see the article on 'Early Man' in this volume.

³ E. T. Newton, 'On the occurrence of Lemmings, etc., in the Thames Valley,' *Geol. Mag.* (1890), dec. 3. vii. 452.

⁴ For further details, see article on 'Palæontology,' p. 31.

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block of flint was restored.¹ In the implement-bearing gravels of Galley Hill, Northfleet, human bones were found which may possibly be of Palæolithic age.²

Old fluviatile deposits are particularly numerous in the Medway valley, and must represent a long period of erosion, as ancient river gravels occur as high as 300 feet above the present stream at East Malling.³ In the brick-earths belonging to this valley, which fill wide 'pipes' and open joints in the Kentish Rag around Maidstone, many mammalian bones have been obtained, including those of mammoth, rhinoceros, hyæna, reindeer, bos, horse, etc., with a few land shells. Similar fossils have occasionally been found in other parts of the valley.⁴

Of still greater interest is the large series of remains which has been collected from a fissure in the Kentish Rag near Ightham, in the valley of the Shode or Plaxtole tributary of the Medway.⁵ These represent most of the large animals last mentioned, along with the roe deer, Arctic fox and common fox, and besides these, the bones of numerous small mammals, birds and reptiles, which were obtained by carefully sifting the material from the fissure. Among these smaller animals were several bats, shrews and voles, with the Norwegian and Arctic lemmings and the pika or tailless hare. Some of these animals are characteristic of the present 'steppe fauna' of northern Siberia, and they afford strong support to the view⁶ that a cold dry climate prevailed in this part of England during some portion of Pleistocene times. The frog, toad, newt, slow-worm, common snake and viper were also recognized; and the birds' bones represented the skylark, with probably the song-thrush, wheatear, wagtail, buzzard, common duck and gull. Numerous land and freshwater shells, with a few insect and plant remains, were also found in this prolific fissure.

Another richly fossiliferous deposit deserving mention is the small patch of gravel and loam worked out many years on the western edge of the little valley at Folkestone, under the old Battery, which yielded remains of the mammoth, rhinoceros, hippopotamus, Irish elk, reindeer, bison, bos, horse, etc.⁷

The valleys of the Stour and the Darent, though less fossiliferous, bear similar testimony to long-continued fluviatile erosion, but we have no space for further details under this head.⁸

¹ See F. C. J. Spurrell, 'On the discovery of the place where Palæolithic Implements were made at Crayford,' *Quart. Journ. Geol. Soc.* (1880), xxxvi. 544-8.

² E. T. Newton, 'On a Human Skull and Limb Bones found in the Palæolithic Terrace-Gravel at Galley Hill, Kent,' *Quart. Journ. Geol. Soc.* (1895), li. 505.

³ *Mem. Geol. Survey*, 'Geology of the Weald,' pp. 172-88.

⁴ e.g. a femur of rhinoceros was recently obtained in drainage-works at Tonbridge, at the southern edge of the Medway flat. See also subsequent article 'Palæontology,' p. 31.

⁵ W. J. Lewis Abbott, 'The Ossiferous Fissures near Ightham'; and E. T. Newton, F.R.S., 'The Vertebrate Fauna from the Fissure . . .,' *Quart. Journ. Geol. Soc.* (1894), l. 171-210. See also 'Palæontology,' p. 31.

⁶ C. Reid, 'Desert or Steppe Conditions in Britain,' *Natural Science* (1893), iii. 367-70.

⁷ S. J. Mackie, *Quart. Journ. Geol. Soc.* (1851), vii. 257. See also 'Geology of the Weald,' p. 163, for other references.

⁸ Among other localities for Palæolithic implements in Kent, probably derived from the River Drift,

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In discussing this branch of our subject it is important to remember that there are no deposits in Kent that can be directly assigned to the glacial agencies which produced such widespread effects in the country north of the Thames. The great ice-sheet that gradually crept over all the northern lands of Europe after the close of Pliocene times seems to have attained its southerly bounds at the estuary of the Thames, so that Kent lay just beyond its margin. But during this Glacial Period the conditions must have been even more favourable to unequal or valley erosion in the bare country, exposed to alternate freezing and thawing and to heavy floods derived from the melting of the winter snows, than in the county farther north, which was to some extent protected by its mantle of permanent ice. Hence, while boulder-clays and glacial gravels were being outspread upon the land to the northward, torrential denudation was rapidly cutting into the Kentish hills and sending turbid floods, active in erosion, along its main valleys. There has been much discussion as to the exact relationship between the Glacial drifts of the north of England and the fossiliferous gravels and brickearths of the Thames valley,¹ the circumstances being of course unfavourable for direct correlation. Some part of the older 'superficial' deposits of Kent are likely to be at least of Glacial age, but as subaerial conditions were persistent throughout the period and have continued to prevail up to the present time, the fragmentary evidence which remains is scarcely sufficient to enable us to recognize the limits of the period in Kent.

Recent Deposits.—Between the deposition of the old river-drift with remains of extinct mammals and present-day conditions there have been many intermediate stages, of which some record is preserved in the lower terraces and recent alluvium of the valleys. These newer deposits all indicate a shrinkage in volume of the rivers, and they also show that within comparatively recent times the land has stood somewhat higher than at present. Excavations for docks and other works below the level of high tide in the Thames valley below London, especially between Woolwich and Erith, have revealed layers of peat with trunks of trees, including the oak and yew, indicating forest growth *in situ*, this peat being interstratified with beds of marsh clay, the whole resting on river-gravel and sand. Where fossils occur in these deposits they are all of species still living; and traces of human work of Neolithic and later date are also occasionally found. The marshes of the lower Thames and of the mouths of the Medway and the Stour are further examples of these recent alluvia, and less extensive deposits of the same kind fringe the streams in the interior.

are West Wickham, Swanscombe, Milton Street, Ash, Darent, Rainham, etc. G. Clinch, 'On Drift Gravels at West Wickham,' *Quart. Journ. Geol. Soc.* (1900), lvi. 8; J. M. Mello, 'On some Palæolithic Implements of North Kent,' *Rep. British Assoc. for 1899* (Dover), p. 753, etc. See also article on 'Early Man' in present volume.

¹ For summary, see *Mem. Geol. Survey*, 'Geology of London,' pp. 353-87.

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Of similar character is the broad flat of Romney Marsh, which like the marshes of the Thames lies below the level of high spring tides. It is fringed along the greater part of its seaward margin by an accumulation of recent shingle, arranged in 'fulls' or 'storm beaches,' and by sand dunes; and where these are wanting the marsh is protected from the sea by artificial embankments. Within the marsh, marine sand and shingle is generally found at a depth of from 10 to 20 feet, but this is overlain by clay and peat with trunks of trees. Great changes have taken place within the recent period in this tract both in the shape of the coast line and in the course of the river Rother across the marsh, but as these will be dealt with by the historian, passing reference to them will here suffice.¹ The great shingle spit at Dunge Ness, where the accumulated 'storm beach' is two or three miles wide, is known to be growing out eastward at a rate estimated at about six yards annually, through the steady transference of the shingle in that direction. Meanwhile on the coast of the marsh to the westward the sea is encroaching, so that the position and shape of the Ness is constantly undergoing modification, and is known to have been quite different a few centuries ago.

Being concentrated upon a narrow shore-line, the effect of the sea upon the land is always more obvious than the subtle all-pervading influence of the atmospheric agencies. It seems scarcely necessary to mention that every part of the Kentish coast, except where artificially protected, is undergoing change, though nowhere so rapidly as at Dunge Ness. Its cliffs are being sapped and torn away piecemeal—rapidly where composed of soft material, as at Sheppey and Reculvers; and more slowly, but still not very slowly, where of firmer build, as in Thanet and the South Foreland; while its shallow estuaries are being gradually silted up and its salt marshes converted into firm land.

DEEP-SEATED ROCKS

Having deciphered the later portion of the geological history of the county, from the records contained in the structure of the present surface, and having thereby incidentally made easier the reading of such evidence as we may possess regarding the rocks which do not appear at the surface, we will now turn back to the earlier chapters of the history and consider the deep foundation of the county.

As mentioned at the beginning of this article, very important additions have been recently made to our knowledge on this subject by the numerous deep borings which have been sunk in search of coal. Though the information as yet published regarding these borings is somewhat limited, it enables us to add very considerably to the list of formations recognized in Kent, and to prove the existence of a downward succession reaching to the base of the Secondary or Mesozoic rocks and even including part of the Palæozoics.

¹ Consult *Mem. Geol. Survey*, 'Geology of the Weald,' chap. xvii. p. 302, for geological account of these changes.

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As regards the history of these coal explorations it will suffice to give references to the already extensive literature of the subject, and to note that so long ago as the year 1856 the opinion that Coal Measures might occur within a workable depth in Kent was clearly stated.¹ It was not until 1890 however that this opinion was verified by a deep boring on the site of the Channel Tunnel Works at the base of Shakspeare Cliff near Dover,² which reached the Coal Measures at a depth of 1,157 feet below the surface and passed through ten³ coal seams at various depths between 1,180 and 2,221 feet, of thicknesses varying from 1 foot to 4 feet and giving an aggregate thickness of 22 feet of coal. This discovery led to the sinking of shafts on the same site, and to the commencement of several other borings in different parts of the interior of the county for the purpose of testing the lateral extension of the Coal Measures, the work being carried on entirely by private enterprise. Owing to engineering difficulties and other causes however, in spite of the expenditure of very large sums of money the Dover shafts have not at the time of writing, reached the coal seams; and only one of the other borings—that at Ropersole, 8 miles north-west of Dover—is known to have entered Carboniferous rocks, while another—at Brabourne, 5 miles east of Ashford—has shown that the Coal Measures do not extend to that place. Sooner or later the deep-seated Coal Measures of Kent will no doubt become of economic importance, and the present aspect of the north-eastern part of the county thereby greatly altered.

For the nearest places where the Jurassic and older rocks proved in these borings may be seen at the surface, we have to look eastward across the Channel to France, or westward to Somerset and the adjacent western counties. The intermediate sections now obtained in Kent are certain to prove of high scientific value in elucidating the deep-seated geology of the whole of the south-east of England.

The following are the records of the Kentish borings which have been published up to the present time:—

¹ R. A. C. Godwin-Austen, 'On the Probable Extension of the Coal Measures beneath the South-eastern part of England,' *Quart. Journ. Geol. Soc.* (1856), xii. 38. This author's opinion was fully discussed and acquiesced in by Prof. J. Prestwich in 'Report on the Probabilities of finding Coal in the South of England,' *Reports of the Coal Commission* (1871), i. 146. The hypothesis was subsequently discussed by many other geologists. For critical review of this literature up to the year 1888 consult W. Whitaker, *Mem. Geol. Survey*, 'The Geology of London' (1889), vol. i. chap. 2, 'Underground Plain of Older Rocks,' pp. 10-49; and in *Journ. Soc. Arts* (1890), xxxviii. 543.

² Prof. W. Boyd Dawkins, under whose advice the boring was made, has published several papers on the history of this exploration and on the results attained: see *Trans. Manchester Geol. Soc.* (1890), xx. 502; (1892) xxi. 456; (1894) xxii. 488; *ibid.* 'History of the Discovery' (1897), xxv. 155; *Reports British Assoc.*: Cardiff (1891), 637; Oxford (1894), p. 648; Dover (1899), p. 734; *Contemporary Review*, April, 1890; *Colliery Guardian*, June, 1894, etc. Also for detailed sections of Dover boring, see W. Boyd Dawkins in third paper above cited; and joint paper by F. Brady, G. P. Simpson and N. R. Griffith, 'The Kent Coalfield,' *Trans. Fed. Inst. Mining Eng.* (1895-6), xi. 540; and for later general discussion of the subject, R. Etheridge, 'On the Relation between the Dover and Franco-Belgian Coal Basins,' *Rep. British Assoc.* Dover (1899), p. 730.

³ Or twelve seams; see Prof. W. B. Dawkins, *Rep. British Assoc.* Dover (1899), p. 736.

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I. DOVER COLLIERY, SHAKSPERE CLIFF ¹

System	Formation	Thickness in feet
Upper Cretaceous	Grey Chalk and Chalk Marl	182
	Gault	121
Lower Cretaceous	Lower Greensand	241
	Weald Clay	
	Hastings Beds	
Upper Jurassic	Kimeridge Clay	613
	Corallian Beds (including 12 feet of oolitic iron-ore) ²	
	Oxford Clay	
Middle Jurassic	Great Oolite Series	
Lower Jurassic	Lias	
Upper Carboniferous	Coal Measures, with eight <i>workable</i> coal seams having an aggregate thickness of 16 ft. of coal	1,157
Total depth of boring		2,314

II. BRABOURNE BORING, 5 MILES EAST OF ASHFORD ³

System	Formation	Thickness: ft.	in.
Upper Cretaceous	Gault	72	6
Lower Cretaceous	Lower Greensand and Atherfield Clay.	231	
	Weald Clay	198	
	Hastings Beds	206	6
Upper Jurassic	Portland Oolite.	14	
	Kimeridge Clay	242	
	Corallian Beds	305	
Middle Jurassic	Oxford Clay	243	
Middle Jurassic	Great Oolite Series	189	1
Lower Jurassic	Middle Lias	74	8
	Lower Lias	98	1
Trias	Triassic Conglomerates	48	4
Palæozoic	Palæozoic Rock, exact age unknown ⁴	88	5
Total		2,010	7

III. ROPERSOLE BORING, 8 MILES NORTH-WEST OF DOVER ⁵

System	Formation	Thickness: ft.	in.
Upper Cretaceous	Upper Chalk	480	
	Middle Chalk	118	
	Lower Grey Chalk	220	
	Glauconitic Marl	16	
	Gault	119	
Lower Cretaceous	Lower Greensand	51	
	Atherfield Clay	21	
	Purbeck-Wealden Beds	55	
Upper Jurassic	Kimeridge Clay (?)	10	
	Corallian Beds	157	
	Oxfordian and Callovian Beds	142	
Middle Jurassic	Bathonian Beds (Great Oolite Series)	164	
Lower Jurassic	Upper Lias (?)	3	
	Middle Lias	24	9
Upper Carboniferous	Coal Measures, with two thin coal seams.	192	10
Total		1,773	7

¹ From summary published by R. Etheridge in *Report British Assoc. for 1899*, p. 733. See also, for full details of section, Prof. Boyd Dawkins in paper above cited; and F. Brady, G. P. Simpson, and N. R. Griffith, *Trans. Fed. Inst. of Mining Engineers* (1895-6), xi. 540.

² W. B. Dawkins, *Rep. British Assoc.* Oxford (1894), p. 648.

³ From record published by R. Etheridge in *Report British Assoc. for 1899*, p. 733.

⁴ In Prof. Boyd Dawkins' opinion 'probably Devonian,' and therefore older than Carboniferous. See *ibid.* p. 736.

⁵ From record published by Prof. Boyd Dawkins, *ibid.* p. 735. The boring was not then completed, but no further details have been published (July 1902).

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FOUR OTHER KENTISH BORINGS,¹ viz. :—

Formation	IV. OTTINGE 10 miles west of Dover	V. HOTHFIELD 3 miles N.W. of Ashford	VI. OLD SOAR 5 miles N.N.E. of Tonbridge	VII. PENSURST (ENSFIELD) 3 miles west of Tonbridge
Lower Greensand and Atherfield Clay . . }	246 ft.	180 ft. +	50 ft.(?)	—
Wealden and Purbeck	146 „ +	593 „ +	650 „ +	1511 ft.
Kimeridge Clay . .	—	—	—	356 „ +

These coal-exploration borings do not however exhaust our information as to the deep-seated rocks of Kent. In the north-west of the county two borings for other purposes had previously reached strata older than any at the surface. These were as follows :

VIII. BORING AT CROSSNESS NEAR ERITH ²

System	Formation	Thickness in feet
Pleistocene . .	Alluvium, Valley Drift, etc.	39
Lower Eocene . .	Lower London Tertiaries	98
Upper Cretaceous	{ Chalk	696 (?)
	{ Gault	175
Trias (?) (or Devonian)	{ Red Marls and Sandstones (of doubtful age)	52
Total . . .		1,060

XI. BORING AT CHATHAM DOCKYARD ³

System	Formation	Thickness in feet
Pleistocene . .	Valley Drift, etc.	27
Lower Eocene . .	Lower London Tertiaries	
Upper Cretaceous	{ Chalk	682
	{ Gault	193
Lower Cretaceous	Lower Greensand	41
Upper Jurassic . .	Oxford Clay	22
Total . . .		965

We will now briefly discuss the fresh discoveries represented by the above records and indicate their principal bearings, referring the reader to the literature mentioned in foregoing footnotes for fuller information.

The first point which deserves attention is the surprising variety of the older divisions of the Secondary rocks both in character and in thickness, and the diversity of the underlying Palæozoic formations. The rapid changes in the underground stratigraphy thus indicated are in striking contrast with the simplicity and regularity of the surface geology of the

¹ Recorded by Prof. Boyd Dawkins, *Report British Assoc. for 1899*, p. 737. Borings have also been made at Pluckley, 6 miles west of Ashford, and at a site between Ropersole and Dover, but the records have not yet been published.

² See Prof. J. Prestwich, *Quart. Journ. Geol. Soc.* (1878), xxxiv. 902 ; also W. Whitaker, 'Geology of London' (1889), i. 19, ii. 66.

³ See W. Whitaker, *Quart. Journ. Geol. Soc.* (1886), xlii. 26, and 'Geology of London,' i. 27. Also 'The Deep-seated Geology of the Rochester District' (Presidential Address), *Trans. South-Eastern Union of Scientific Soc.* for 1899.

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same tracts. It is remarkable also that all the Lower Cretaceous beds, that at the surface stretch, as we have seen, from east to west across the county with only slight modification, are found, when their underground course is traced, to alter their character or to disappear entirely within a few miles to the northward of their outcrop. Deep borings to the north of the Thames have shown that this thinning away of the Secondary rocks below the Chalk becomes still more pronounced beyond the Kentish boundary.

As to the Palæozoic rocks, beyond the fact that they differ entirely in character in different parts of the county and that the Coal Measures are certainly present at Dover and Ropersole, we have not much definite information, as it has not been found possible to determine the exact age of the lowest beds reached in the Brabourne and Crossness borings on the scanty evidence available. It is clear however that at some time before the deposition of the Mesozoic beds these Palæozoic rocks had formed a land surface, their component strata having been previously disturbed and tilted and brought within the reach of erosive agencies; so that at the commencement of the Secondary era they had been denuded across the edges and planed down to an uneven floor of diverse composition, upon which the Mesozoic rocks were afterwards deposited. The Triassic conglomerate of the Brabourne section, made up of pebbles of older rocks, bears witness to this ancient epoch of land waste.

Early in Secondary times, portions of this land were submerged beneath the sea, and soon the irregular 'Palæozoic floor' was buried under the newer sediments, which rested unconformably across the worn edges of the older formations. By unequal movement or tilting, perhaps in gentle stages oft repeated, this floor was raised up northward, so that the Secondary deposits were either unable to accumulate to so great a thickness in that quarter as in the gradually sinking area to the south, or were removed after their accumulation by being brought within the reach of currents and wave-action. Thus may we explain the rapid thinning away northward of all the Secondary rocks below the Chalk, and their great thickness in the more southerly of the Kentish borings and in Sussex.

The Jurassic (Lower Mesozoic) beds underlying Kent consist of thick alternations of clays and limestones, the latter frequently showing characteristic round-grained 'oolitic' structure. These beds, from the Lias upward to the base of the Purbecks, indicate a continuity of marine conditions—at least in the south of the county—and have yielded numerous fossils by which they can be identified and correlated with beds of the same age in the west of England. The limestones of the 'Corallian' division, like those of that period in other parts of the country, are crowded with fossil corals, and have probably originated as true coral reefs of the ancient sea.

At Crossness the whole of the Jurassic and Lower Cretaceous beds are absent, while at Chatham the attenuated representative of the Lower Greensand rests directly on Oxford Clay although in the south

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of the county the borings indicate two or three thousand feet of strata of intermediate age.

Where the uppermost Jurassic beds are preserved they show that after the deposition of the Kimeridge Clay, which appears to have accumulated in waters of some depth, the sea became shallow and its bottom covered with sand ('Portlandian'), and at a later stage ('Purbeck Beds') its site was occupied by lagoons of brackish water through the increasing influence of the rivers draining from the land; until finally the freshwater Wealden conditions were established, under which the older surface rocks of the county were accumulated, as previously described.

The northward overlap of the freshwater Wealden deposits across the boundaries of the marine Jurassic series, and the further overlap of the Gault and Chalk across the limits of both, are proof that the relative uplift of the northern district must have been repeated at several stages before the deposition of the Chalk. But after the great Upper Cretaceous subsidence the axis of main uplift was shifted farther southward; and as already shown, the Wealden anticline was raised over the tract in which the Jurassic and Lower Cretaceous rocks had attained their greatest thickness.¹ The pressure which caused the upward bulging of the Wealden dome appears to have acted laterally from the south, the thick masses of yielding Secondary sediments, confined by the rigid Palæozoic slope on the north, obtaining relief from the compression by broad undulation.

In this glimpse at the foundation rocks of the county we have been enabled to trace the outlines of its evolution backward to the remoter periods of geological time. But it must be remembered that in other regions there are rocks now exposed at the surface of far higher antiquity than the oldest of those reached by the deep borings in Kent, and that although our records have covered a past that is immeasurable by any time-standard within our grasp, they yet fail by many æons to reach backward to the known limits of geological time. The Palæozoic sediments of Kent must themselves have had a floor on which to rest; and our knowledge is bounded only by the limitations of our researches.

¹ As pointed out by Topley (*Quart. Journ. Geol. Soc.* xxx. 186, and 'Geology of the Weald,' p. 241), the Wealden dome may have been in part built up by this thickening of the Secondary rocks toward its centre, independently of the effect afterwards produced by unequal uplift.

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THE river gravels and alluvial deposits, the London Clay and the Cretaceous rocks of Kent are noted for the abundance and fine preservation of their vertebrate fossils ; and a large number of genera and species have been described from the two last-named formations on the evidence of Kentish specimens. The London Clay of Sheppey has in fact furnished practically all our information with regard to the birds which inhabited England during the early part of the Eocene period ; and the vertebrates of the Folkestone Gault are to a great extent unknown elsewhere. The fissure of Pleistocene age at Ightham has revealed the existence at a time when the mammoth and woolly rhinoceros roamed over the south-east of England of a fauna largely composed of species still existing. Of the other Pleistocene deposits in the county perhaps the most important are the gravels at Aylesford and Maidstone and the so-called bone-bed at Folkestone.¹ An interesting fact in connection with the county is the discovery of fossil remains of the woolly rhinoceros at Chartham about the middle of the seventeenth century, to which further allusion is made below.

The vertebrate fauna from one of the fissures in the Kentish Rag near Ightham, which, as already said, is considered to be of Pleistocene age, has been described by Mr. E. T. Newton,² and is remarkable for the number of species of the smaller mammals, whose remains are so seldom preserved in formations of this age. The remains include those of several kinds of bats, all apparently referable to existing species ; as well as of the common and the lesser shrew and the mole. The Ightham Carnivora comprise the wolf, fox, Arctic fox (*Canis lagopus*), wild cat, cave-hyæna (*Hycæna crocuta spelæa*), brown bear, badger, otter, weasel, polecat, and a species regarded as an extinct kind of polecat and named *Mustela robusta*. The rodents include an extinct species of suslik (*Spermophilus erythrogenoides*) ; the wood-mouse (*Mus sylvaticus*), and an extinct species of the same genus named *M. lewisi* ; six or seven species of voles, some of which are unknown in the living state in Britain ; the Norwegian lemming (*Lemmus lemmus*) and the banded lemming (*Dicrostonyx torquatus*) ; the common pica (*Ochotona pusilla*) ; the common hare, the mountain hare (*Lepus timidus*), and the rabbit, the remains of the latter being probably of later age than those of the other mammals.

¹ See S. J. Mackie, *Quart. Journ. Geol. Soc.* (1851) vii. 257.

² *Ibid.* (1894) l. 188, and (1899) lv. 419.

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The hoofed mammals include the red deer, the reindeer, the roe, the wild boar, the horse, the woolly rhinoceros (*Rhinoceros antiquitatis*), and the mammoth (*Elephas primigenius*).

Mr. Newton also records a number of species of birds and a few of reptiles and amphibians from the Ightham fissure ; but since all these appear to belong to living British species, and the determinations are in some instances more or less provisional, it will be unnecessary to mention them by name on the present occasion.

The list of mammals from Kentish Pleistocene deposits other than the Ightham fissure includes the following species. Of the cave-lion (*Felis leo spelæa*) the British Museum possesses a fine skull collected by Mr. Spurrell and two fragments of the lower jaw from Crayford and a couple of imperfect bones from Slade Green near Erith ; and remains of the species have also been obtained from Sittingbourne. The cave-hyæna (*Hyæna crocuta spelæa*), a variety of the living spotted African species, has been recorded from Erith, the wolf (*Canis lupus*) from Slade Green, and the fox (*C. vulpes*) from Dartford. Of the other Carnivora, the brown bear (*Ursus arctus*) has left its remains at Crayford, and the badger (*Meles meles*) at Grovehurst in Milton-next-Sittingbourne. The rodents from the same deposits comprise the field-vole (*Microtus agrestis*) at Crayford, and the water-vole (*M. amphibius*) at Crayford and Erith, as well as the suslik mentioned above under the heading of the Ightham fauna, which has been recorded from Erith.

Among the hoofed mammals, remains of the aurochs,¹ or extinct wild ox (*Bos taurus primigenius*), occur at Broadmead near Folkestone, Herne Bay, Maidstone and Slade Green ; and those of the Pleistocene bison (*B. bonasus*) at East Wickham, Crayford, Folkestone and Woolwich. Very noteworthy is the occurrence of the musk-ox (*Ovibos moschatus*) in the Crayford deposits,² and also at Plumstead, since remains of that ruminant are very scarce in Britain. Bones and antlers of the red deer—probably the Caspian race (*Cervus elaphus maral*)—have been discovered at Crayford, Folkestone, Maidstone and Slade Green ; those of the giant fallow deer—the so-called Irish elk—(*C. giganteus*) at Folkestone ; and those of the reindeer (*Rangifer tarandus*) at Boughton, Folkestone, Otterham in Upchurch and Sittingbourne. The Pleistocene hippopotamus (*Hippopotamus amphibius major*) has been recorded from Folkestone, and the wild boar (*Sus scrofa*) from Maidstone.

Special interest attaches to a fragment of the skull and three upper molar teeth of the woolly rhinoceros (*Rhinoceros antiquitatis*) from Chartham near Canterbury, which are preserved in the British Museum. These specimens were obtained in 1668 by a Mr. J. Somner, and are described as the remains of a sea monster in a rare pamphlet, published the following year in London, and entitled *News from Chartham in Kent, etc.* Of this pamphlet (which is reprinted in the *Philosophical Transac-*

¹ This name is frequently misapplied to the bison.

² See W. Davies, *Geological Magazine*, 1880, p. 246.

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tions for 1701, p. 882) there is a copy in the King's Library, British Museum. The specimens are described, with a woodcut of one of the teeth, in Owen's *British Fossil Mammals and Birds*, under the name of *R. tichorbinus*.

Remains of the woolly rhinoceros are also recorded from the gravels of Aylesford, Canterbury, Chatham, Erith, Folkestone, Maidstone and Sittingbourne. Teeth of two other species of rhinoceros, *R. leptorbinus* and *R. mercki*, have been obtained at Crayford; in both these species the upper cheek-teeth are of a simpler type than those of the woolly rhinoceros. Teeth and other remains of the wild horse (*Equus caballus fossilis*) have been met with at Chatham, Crayford, Erith, Maidstone, Sittingbourne, Slade Green and other places in the county.

Of the mammoth, or hairy elephant (*Elephas primigenius*), molars, tusks or bones have been found in many localities in the county, among them Aylesford, Borstall near Rochester, Canterbury, Chatham, Crayford, Erith, Folkestone, Green Street, Maidstone, the bed of the Medway, Redborough near Rochester, Shoreham near Sevenoaks, Sittingbourne and Slade's Green near Crayford. Remains of the straight-tusked elephant (*E. antiquus*) are less common, but have been recorded from Aylesford, Canterbury, Chatham, Maidstone and Slade's Green.

From the Pleistocene to the Lower Eocene is a long jump, but it is not till we reach the London Clay of the Isle of Sheppey that we meet with any other mammalian remains (at least of any importance) in the county. Very interesting, but unfortunately very imperfect, is part of a mammalian skull, without the crowns of the teeth, which has been made the type of a genus and species by the late Mr. W. Davies under the name of *Argillotherium toliapicum*.¹ It is believed to indicate a member of that primitive group of extinct carnivora known as the Creodontia. A vertebra from Sheppey in the British Museum has been assigned to *Coryphodon eocænus*, a primitive hoofed mammal typified by teeth dredged off the Essex coast. More interesting is an imperfect skull from the London Clay near Herne Bay, constituting the type specimen of *Hyracotherium leporinum*, a small hoofed mammal of the approximate size of a fox, which forms one of the earliest stages in the evolutionary line culminating in the modern horse. Part of a lower jaw from Sheppey has been provisionally assigned to the same animal. Both these valuable specimens are in the British Museum. The palatal portion of the skull of another small mammal from Herne Bay, now in the York Museum, has been described as *Platychoærops richardsoni*. It is the only known specimen of its genus and species, and its affinities are doubtful; it is also known by the name of *Miolophus planiceps*. The Kentish specimens of the three species last mentioned are all recorded in part iii. of the British Museum *Catalogue of Fossil Mammalia*.

No less than six genera and species of extinct birds have been established on the evidence of specimens from the London Clay of Sheppey, five of which will be found noticed in the British Museum

¹ See *Cat. Foss. Mamm. Brit. Mus.* i. 41.

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Catalogue of Fossil Birds. Among these the one known as *Lithornis vulturinus* is represented by fragments of the skeleton, and is believed to be one of the birds of prey. *Argillornis longipinnis*, on the other hand, appears more nearly allied to the gannets, and had a spread of wing fully as great as an albatross. A skull recently described by Dr. C. W. Andrews¹ as *Prophaethon shrubsolei* (appropriately named in honour of Mr. W. H. Shrubsole, the enthusiastic collector of Sheppey fossils) may perhaps be regarded as indicating an ancestral type of tropic-bird (*Phaethon*). More remarkable is *Odontopteryx toliapica*, a genus and species named on the evidence of an imperfect skull in which the jaws are strongly serrated, these serrations being in the bone itself and having nothing to do with true teeth. Probably this bird was distantly related to the gannet group (*Steganopodes*). Another type is *Halcyornis toliapicus*, originally described from a small skull which was supposed to show affinity to the kingfishers. Judging however from a wing-bone provisionally assigned to the species, its relations seem to be with the gulls. Lastly, *Dasornis londiniensis* is known by a portion of a skull from Sheppey, which indicates a bird of the approximate size of an ostrich. Although the affinities of this gigantic bird are still problematical, it was apparently related to *Gastornis klaaseni*, known by some limb-bones from the Lower Eocene strata of Surrey.

Of the reptiles from the London Clay of the county all but three belong to the chelonian order (tortoises and turtles); the exceptions being a crocodile and one or two serpents. The crocodile (*Crocodylus spenceri*) is a long-snouted species typified by a skull from Sheppey in the collection of the British Museum; it has received two other names, *C. toliapicus* and *C. champsoides*. The snakes from this formation indicate a distinct family (*Palæophidæ*), and were probably of marine habits. The typical *Palæophis toliapicus*, which seems to have attained a length of from ten to twelve feet, was described upon the evidence of vertebræ from Sheppey, but is also recorded from the Middle Eocene beds of Sussex. The larger *P. typhaeus*, on the other hand, is typically from Sussex, but apparently also occurs at Sheppey.

Among the tortoises and turtles from the Kentish Eocene, the existing soft tortoises (*Trionychidæ*), characterized by their sculptured shells, devoid of horny shields, are represented by *Trionyx pustulatus*, a species described on the evidence of a single plate of the upper shell from Sheppey. Another plate from the same locality, in the British Museum,² apparently indicates a second Kentish species of the genus. The soft tortoises are now confined to the warmer regions of the globe, where they are widely spread; and their presence at Sheppey is indicative of the tropical or subtropical nature of the Lower Eocene fauna. Among the marine turtles, or *Chelonidæ*, the extinct genus *Argillochelys* is typified by specimens from the London Clay of Sheppey, in which formation

¹ *Proc. Zool. Soc. London*, 1899, p. 776.

² See *Cat. Foss. Rept. Brit. Mus.* iii. 21; in the same volume will be found descriptions of the other Sheppey chelonians.

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occur the remains of four species, namely, *A. antiqua*, *A. cuneiceps*, *A. convexa*, and *A. subcristata*. These turtles appear to have been related to the existing loggerhead (*Thalassochelys*), but were of comparatively small size. The genus *Thalassochelys* itself is also recorded from Sheppey, although the specimens in the British Museum on which the determination rests are scarcely sufficient to afford specific characters. A second extinct genus of the family is represented in the London Clay of Sheppey by *Lytoloma crassicostatum* and *L. planimentum*, although both these species were originally described upon the evidence of Essex specimens. The turtles of this genus, which were of large size, differ from their modern cousins, among other characters, by the great extent of the union between the two branches of the lower jaw, and the backward position in the skull of the inner apertures of the nasal passage.

Passing on to the typical tortoises and terrapins (*Testudinidæ*) it may first of all be mentioned that a tortoise-shell from Sheppey originally described as *Emys comptoni* has been assigned to the existing African genus *Homopus*, the members of which are terrestrial in their habits. Two species of terrapin from the same locality and formation, to which the names *Emys testudiniformis* and *E. bicarinata* were given by their describers, are now known to be members of the existing American genus *Chrysemys*. Of special interest are two other freshwater tortoises from the London Clay of Sheppey, since they belong to the family *Pelomedusidæ*, the existing members of which, like all the tortoises which move their heads and necks sideways (*Pleurodira*), are confined to the southern hemisphere. One of these, *Podocnemis bowerbanki*, belongs to a genus now living in South America and Madagascar, the typical Amazonian *P. expansa* being the largest of existing freshwater tortoises. The second, *Dacochelys delabechei*, has been made the type of a genus by itself, but might perhaps be better included in *Podocnemis*. It was as large as the existing Amazonian species mentioned above.

The list of chelonians from the London Clay of Sheppey closes with the huge *Eosphargis gigas*, a species at first referred to the true turtles, but now known to represent an extinct genus of leathery turtles (*Dermochelyidæ*), which differ from the former, among other characters, by the upper shell being formed typically of a number of small bones arranged so as to form a mosaic-like pavement. Some idea of the size of the Sheppey species may be gathered when it is stated that the skull measures 13 inches in diameter. There are numerous remains of this huge turtle in the British Museum, all from Sheppey.

The numerous fishes from the London Clay of Sheppey are for the most part of great interest, several of them being the sole representatives of their genera. Some have been quite recently named by Dr. Smith Woodward in the fourth part of the British Museum *Catalogue of Fossil Fishes*; to which work the reader may be referred for full descriptions of the fossil fishes from all the formations of the county.

Commencing with the sharks and rays, we find two species of

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eagle-ray, *Myliobatis goniopleurus* and *M. toliapicus*, described on the evidence of their roller-like dental plates from Sheppey. An extinct species, *Rhinoptera daviesi*, of an allied living genus, is known by a single specimen of the dentition in the British Museum. The long-tailed eagle-rays, whose dentition differs from that of *Myliobatis* by having no lateral plates, are represented in this formation by *Aëtobatis irregularis*, a species described on the evidence of Sheppey specimens but also occurring in other Eocene deposits.

Among the sharks, the existing genus *Notidanus*, characterized by its comb-like teeth, is represented at Sheppey by *N. serratissimus*, a species somewhat widely spread in the Eocene, but typically from that locality. Of sharks allied to the existing porbeagle the widely spread *Lamna macrota*, *Otodus obliquus*, *Odontaspis elegans*, and *O. cuspidata* have left their sharply pointed teeth in the clay of the Isle of Sheppey, but neither species is typically Kentish; the species of *Odontaspis* also occur at Herne Bay. A small relative (*Carcharodon subseratus*) of the great Rondelet's shark of modern seas is typified by a single tooth from Sheppey in the collection of the British Museum.

Of fishes allied to the existing chimæra, or king of the herrings, dental plates referable to two extinct genera are not uncommon at Sheppey. One of the species, *Edaphodon bucklandi*, was first described from the Middle Eocene of Sussex, but the second, *Elasmodus hunteri*, although also common to the Middle Eocene, is typified by a Sheppey specimen in the Museum of the Royal College of Surgeons.

Very interesting is the occurrence in the London Clay of Sheppey of dermal bones of a sturgeon, which have been provisionally assigned to the typical living genus under the name of *Acipenser toliapicus*; they afford the earliest known evidence of true sturgeons.

Of the pycnodont ganoids—those hard-scaled extinct fishes with a pavement of bean-like crushing teeth in the mouth—the species *Pycnodus toliapicus* and *P. bowerbanki* are both peculiar to Sheppey, the latter being apparently only known by the type specimen in the British Museum.

To a more modern type of fish—the *Elopidæ*, relatives of the herrings—belongs a fossil in the British Museum from Sheppey which is provisionally assigned to the living genus *Elops*. Two extinct species, *Megalops priscus* and *M. oblongus*, of the other existing genus of the family, are peculiar to the Sheppey deposits; the same being the case with *Esocelops cavifrons*, the sole representative of its genus, and known only by a couple of specimens in the national collection. In the allied family *Albulidæ*, the typical genus, of which one tropical species still survives, is represented by *Albula oweni* in the Sheppey deposits, a species apparently also occurring in the Middle Eocene of Belgium. The genus and species *Brychætus muelleri*, belonging to the family *Osteoglossidæ*, now characteristic of the southern hemisphere, have been described recently by Dr. Smith Woodward on the evidence of remains from Sheppey in the British Museum. In the herring family (*Clupeidæ*) re-

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mains of *Halecopsis insignis*, a genus and species typically from the Belgian Eocene, occur at Sheppey.

A specially interesting Sheppey fish is *Bucklandium diluvii*, the only member of an extinct genus of cat-fishes (*Siluridæ*), apparently only known by a single specimen in the British Museum. Two other remarkable fishes from the Sheppey Eocene are *Rhynchobrinus branchialis* and *R. major*, the sole representatives of a genus of marine eels (*Murænidæ*) apparently nearly related to *Eomyrus* of the Belgian Eocene. The tunnies (*Scombridæ*) are represented by *Eothynnus salmoneus*, a genus and species at present known only by Sheppey specimens; another extinct genus, with the two species *S. nuchalis* and *S. macropomus*, of the same family peculiar to the formation and locality being *Scombrinus*.

From a still older Eocene deposit, the Thanet Sands of Reculvers, are known four teeth of an extinct porbeagle-like shark, *Odontaspis rutoti*, typified by remains from the Belgian Eocene.

Coming to the fauna of the Cretaceous formations of the county we find the list of reptiles from the Chalk by no means large. It includes however two species of gigantic flying saurians, or pterodactyles, assigned to the Cretaceous genus *Ornithochirus*, under the names of *O. compressirostris* and *O. giganteus*. Of both these species the type specimens (now in the British Museum) were obtained by Bowerbank from the Lower Chalk of Burham, the well known locality at the foot of the Chalk escarpment at Blue Bell Hill, which has yielded such a number of vertebrate remains. *Acanthopholis horridus*, an armoured herbivorous dinosaur, apparently allied to *Scelidosaurus* of the Lias, was named by the late Professor Huxley on the evidence of vertebræ and dermal plates from the Chalk-marl of Folkestone. The great Cretaceous marine lizards known as Mosasaurians (on account of the remains of the type species having been obtained from the valley of the Meuse) are represented in the Kentish Chalk by one tooth from Gravesend and a second from Maidstone in the collection of the British Museum, but neither has been generically determined. Another group of marine lizards is typified by *Dolichosaurus longicollis*, a comparatively small reptile described on the evidence of an imperfect skeleton from Burham, and occurring elsewhere in the county at Liddon Spout near Folkestone. Part of the lower jaw of a reptile from the Middle Chalk of Cuxton has been regarded by Mr. E. T. Newton as possibly belonging to the Rhynchocephalia—a group represented at the present day only by the New Zealand tuatera (*Sphenodon*).

Of the chelonian order (turtles and tortoises) two species are definitely known from the Kentish Chalk. One of these is a marine turtle, probably allied to the huge *Chelone hoffmanni* of the topmost Cretaceous of Belgium, and represented in the British Museum by remains from Dover and Rochester. The second species, *Chelone* (or *Cimoliobelys*) *benstedii*, is typified by a specimen from Burham, and is also known by remains from Wouldham and perhaps other localities in the county. Possibly certain chelonian remains from the Gault of Folke-

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stone belong to this species. All the known specimens indicate immature individuals.

Among the fish-lizards, or ichthyosaurians, the common Cretaceous species *Ichthyosaurus campylodon* is represented in the county by teeth and jaws from the Lower Chalk of Dover and the Chalk-marl of Folkestone, as well perhaps as from the Gault of the latter place. Of the plesiosaurians, another group of marine saurians, differing from the ichthyosaurians, among other features, by the structure of the skeleton of the paddles, the long-necked Cretaceous genus *Cimoliosaurus* is represented by *C. smithi* in the Upper Chalk of Burham, and possibly also in the Folkestone Gault. Large fluted teeth from the Chalk of Charing, Cuxton, Dover and Halling, described under the name of *Polyptychodon interruptus*, indicate a huge short-necked member of the same order, the type specimens of which appear to be Kentish. Other teeth from the Chalk of the county have been referred to the closely allied, if not identical, *P. continuus*, which is typically of Lower Greensand age.

The fishes from the Kentish Chalk form a list of almost appalling length, including over seventy species. The beautifully corrugated and pustulated crushing teeth of the Cretaceous rays of the genus *Ptychodus* are not uncommonly met with (sometimes in associated sets) in the chalk pits of the county, where no less than seven species are represented. These are *P. mammillaris*, from Chatham, Cuxton, Dover, Halling, Maidstone and Rochester; *P. rugosus*, from Chatham, Dover, Greenhithe and Rochester; *P. oweni*, from Snodland and elsewhere; *P. decurrens*, from Burham, Dover, Halling and Maidstone; *P. polygyrus*, from Bromley, Burham, Charlton, Gravesend, Halling, Maidstone and Northfleet; *P. multistriatus*, from Burham, Dover, Maidstone and elsewhere; and *P. latissimus*, from Maidstone and other localities. Of these only the third and sixth were named on the evidence of Kentish specimens.

Of the comb-toothed sharks remains of *Notidanus microdon* occur at Burham, Charing and Maidstone. In the group of sharks (*Cestraciontidae*) allied to the existing Port Jackson species, so well known for its beautiful crushing teeth, the existing genus is represented by *Cestracion canaliculatus* at Bromley, and *C. rugosus* at Charing, Dover and Maidstone, as well as in the Folkestone Gault. Another (extinct) generic type is represented in the Dover Chalk by *Synechodus illingworthi*, and in that of Dover, Gravesend and Margate by *S. dubrisiensis*; the latter species being named on the evidence of Kentish specimens. Two species of dog-fish (*Scyllium antiquum* and *S. dubium*) are severally founded upon single specimens, the one from Dover and the other from Burham. Two species of beaked sharks (a genus still surviving in Japanese waters), namely *Scapanorhynchus rhabiodon* and *S. subulatus*, are known from the Chalk of the county, the latter being recorded from Charing, Dover, Greenhithe and Halling. Of far greater local interest is however *Cantioscyllium decipiens*, an extinct genus and species of shark, with striated teeth, known only by part of the skeleton from the Lower Chalk of

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Burham. Of the porbeagle sharks the existing genus *Lamna* is represented by *L. appendiculata* in the Lower Chalk, Chalk-marl and Gault of the county, *L. semiplicata* at Charing and Rochester, and *L. sulcata* at Rochester; and the extinct *Odontaspis* by *O. mantelli* at Burham, Charing, Dover, Gravesend and Greenhithe, and *O. angustidens* at Dover and Halling, neither of these species being typically Kentish. Finally, the broad-toothed sharks of the Cretaceous genus *Corax* are represented in the county by remains of the widely spread *C. falcatus*, which have been recorded from the Chalk of Bromley, Greenhithe, Margate and Maidstone.

Among the chimæroid fishes a lower jaw in the British Museum believed to be from Kent has been described as *Ischyodus incisus*, but the generic reference is open to some degree of doubt. In the allied genus *Edaphodon* the species *E. mantelli*, typically from Sussex, is also known from Burham, Charing and elsewhere in Kent, and the Sussex *E. agassizi* is likewise recorded from Burham. The Sussex *Elasmodectes willetti* is also known from Burham. The fringe-finned ganoids are represented in the Lower Chalk of Dover and Maidstone by the well known *Macropoma mantelli*, a species first described from Sussex.

In the sturgeon group the existing family *Polyodontidæ* is represented by the genus and species *Pholidurus disjunctus*, described by Dr. Smith Woodward on a fragment of the tail from Gravesend in the collection of the British Museum. Quadrangular polished scales of the general type of those of the ganoid *Lepidotus* in the same collection from the grey Chalk of Folkestone have been provisionally assigned to that genus with the name of *L. pustulatus*. Among the allied pycnodont ganoids a specimen in the British Museum of the lower dentition from Halling has been made the type of *Cælodus fimbriatus*, while the continental *Pycnodus* (?) *scrobiculatus* is represented in the same collection by the palatal dentition from Charing. In another group of ganoids—the *Eugnathidæ*—the genus and species *Neorhombolepis excelsus* have been established by Dr. Smith Woodward on the evidence of a specimen from Halling, while a Burham ichthyolite has been made the type of *N. punctatus*. To the same family belongs *Lophostomus dixonii*, typically from Sussex, but also known in the Maidstone Chalk. The spear-like teeth of the widely spread *Protosphyæna ferox* occur at Burham, Cuxton and elsewhere in the county, and those of *P. minor* at Burham; a third species, *P. compressirostris*, has been founded by Dr. Smith Woodward on the evidence of a beak in the British Museum from the Kentish Chalk. In another family of long-beaked ganoids, the *Aspidorhynchidæ*, the Sussex fish *Belonostomus cinctus* is known in Kent by remains from Burham.

Passing on to the herring-like fishes of the family *Elopidae*, we find the genus and species *Elopopsis crassus* typified by remains in the Brighton Museum from Malling, and also represented by a Kentish specimen in the British Museum. In another genus of the same family (typified by the Sussex *O. lewesiensis*) we have *Osmeroides levis* described on the evidence of remains from Burham. A third genus of the family has a

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species, *Thrissopater magnus*, based on remains from Hollingbourne; while in a fourth we have the species *Pachyrhizodus basalis* and *P. dibleyi* (Burham and Maidstone) based on Kentish specimens, and likewise examples of the more widely spread *P. gardneri* (Burham, Cuxton and near Folkestone) and *P. subulidens* (Bromley, Burham and Halling). The fish described by Dixon as *Plethodus expansus* is typified by a lower dental plate from Malling, and also occurs at Gravesend and Maidstone, as well as in the Folkestone Gault; its serial position is not definitely ascertained, but it probably belongs to one of two still existing families—the *Osteoglossidæ* or the *Albulidæ*. A second Sussex species of the genus *P. oblongus* occurs at Dover, while *P. pentagon*, from Burham and Dover, is typically Kentish.

In the family *Chirocentridæ* the typically American Cretaceous *Portheus* is represented in the Chalk of the county by *P. daviesi*, a species named from a Maidstone specimen, and likewise at Halling by *P. gaultinus*, typically from the Folkestone Gault. In another genus of the same family the species *Ichthyodectes minor* has been recorded from Maidstone and *I. elegans* from Dover and Halling, while *I. tenuidens* has been named from a Burham specimen. To the same family belongs *Cladocycylus lewesiensis*, a typically Sussex fish of which remains are known from Burham and Dover. *Saurodon intermedius*, a member of a genus of the same family occurring typically in the North American Cretaceous, was named on the evidence of remains from Dover; and *Tomognathus mordax*, a Sussex fish which may perhaps be included in the same family, is represented in the Chalk of Kent by remains from Burham, Chatham and Rochester.

Three fishes, *Ctenobrissa radians*, *C. microcephala* and *Aulolepis typus*, of which remains occur at Burham, are typically from the Sussex Chalk, and represent an extinct family (*Ctenobrissidæ*) nearly allied to the modern herrings. The first genus takes its name from the fact that the edges of the scales are pectinated, whereas in the second they are smooth. To the allied family *Halosauridæ* (still represented in deep water at the present day by a member of the type genus) belongs *Enchelurus anglicus*, a species recently described by Dr. Smith Woodward on the evidence of a specimen believed to be Kentish; the other two members of the genus are respectively from Westphalia and Syria. In the extinct family *Dercetidæ*, allied both to the herrings and salmonoids, we have *Leptotrachelus elongatus*, typically a Sussex fish, recorded from the Chalk of Bromley, Charlton and Dover; while in the *Enchodontidæ* there is *Enchodus lewesiensis* from Bromley and Burham, and *E. pulchellus* from an unknown locality in the county, the former being typically a Sussex and the latter a Kentish fish. To the same family belong *Halec eupterygius*, from Burham, Halling and Rochester; *Cimolichthys lewesiensis*, from Burham, Dover, Halling and Maidstone; and *Prionolepis angustus*, from Dover—the two latter being typically from Sussex and the third from Cambridgeshire. In the still living family of scopoloids (*Scopelidæ*) are included *Apateodus striatus*, from Burham, Cuxton and Maidstone, and

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A. lanceolatus, from Dover—the former being typically from Sussex, while the latter seems to be known solely by Kentish examples.

Syllæmus anglicus, of which remains have been described from the Chalk of Burham and Dover and the Gault of Folkestone, as well as from Surrey, is allied to the atherines (*Crossognathidæ*). More interesting still is *Urenchelys anglicus*, typically from the Lower Chalk of Dover, the Kentish representative of a genus of eels (*Muraenidæ*) first described from the North American Cretaceous. In the existing family *Berychidæ* we have remains of the well known Sussex fish *Hoplopteryx lewesiensis* recorded from the Chalk of Cuxton, Dover, Folkestone, Halling and Rochester; while those of *H. superbus*, likewise typically Sussex, occur at Maidstone and other places in the county. Another member of the same family, *Homonotus dorsalis*, was described by Dixon on the evidence of an imperfect fish in the Brighton Museum from Malling, other remains occurring at Bromley, Charing and Northfleet. A well known fish from the Sussex Chalk, named *Berycopsis elegans*, perhaps belonging to the family *Stromateidæ* (allies of the horse-mackerels), is represented in the county by specimens from Burham, Cuxton and Maidstone.

From the Upper Greensand of Maidstone has been described a species of Port Jackson shark under the name of *Cestracion sulcatus*, apparently the only fish named from that formation in the county.

In addition to teeth of the common Cretaceous fish-lizard *Ichthyosaurus campylodon*, the Gault of Folkestone has yielded remains of a few reptiles, all but one of which have been named on the evidence of specimens from this formation. They include two species of pterodactyles of large size, namely *Ornithochirus daviesi* and *O. diomedius*, the remains of the former having been originally regarded as those of a bird. Also three plesiosaurs, or long-necked marine saurians, respectively named *Cimoliosaurus cantabrigiensis*, *C. constrictus* and *C. smithi*, the former being typically from the Cambridge Greensand and the latter also occurring in the Kentish Lower Greensand. A species, *Rhinobelys elegans*, belonging to a genus of small marine chelonians occurring typically in the Cambridge Greensand, and taking their name from a peculiarity in the structure of the bones of the nose, has also been named on the evidence of a Folkestone skull.

The fishes of the Folkestone Gault, in addition to a few species common to the Chalk already noticed, comprise the following. The comb-toothed sharks are represented by a species recently described from this formation by Dr. A. Smith Woodward under the name of *Notidanus lanceolatus*, while crushing sharks' teeth from Folkestone have been made by the same author the types of a species of *Acrodus*, as *A. levis*. Another cestraciont shark, *Synechodus recurvus*, typically from the Russian Cretaceous, has also been identified from the Folkestone Gault. Among the porbeagle family there occur remains of *Oxyrhina macrorhiza*, a species typically from the Swiss Cretaceous, and also of *Lamna macrorhiza*, which was named on the evidence of North American specimens.

Among the chimæroids the species *Ischyodus thurmanni*, originally

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described from the Swiss Cretaceous, is represented both in the Gault of Folkestone and the Lower Greensand of Maidstone. In the allied genus *Edaphodon* we have *E. sedgwicki*, typically from the Lower Greensand of the Isle of Wight, in the Folkestone Gault, and perhaps also in the Chalk-marl of Dover ; while a second species, *E. laminosus*, is typically from Folkestone.

In a very different group of fishes the pycnodont ganoids are represented by *Cælodus ellipticus*, a large species known only by a single specimen of the dentition from Folkestone preserved in the collection of the British Museum.

In the herring group the genus and species of *Elopidae* known as *Thrissopater salmoneus* were described on the evidence of Folkestone specimens. In another family *Portheus gaultinus*, already referred to, is typically from Folkestone ; and the same is the case with *Ichthyodectes serridens*, of which only the type specimen appears to be known.

The remains of both reptiles and fishes appear to be comparatively rare in the Lower Greensand of the county, although special interest attaches to some of the former. Most interesting of all perhaps is a large slab of sandstone from the Kentish Rag (Hythe beds of the Lower Greensand) from near Maidstone, preserved in the British Museum, and containing a considerable portion of the skeleton of the great herbivorous, bipedal, terrestrial dinosaurian reptile *Iguanodon mantelli*. This fine specimen, obtained in 1834 by Mr. W. H. Bensted, is generally regarded as the type of the species, which is itself the type of the genus. The name *Iguanodon* was however given by Mantell on the evidence of teeth from the Wealden of Sussex, and refers to a supposed resemblance existing between these teeth and those of the South American lizards known as iguanas. A cast of the complete skeleton of a larger species of *Iguanodon*, from Belgium, is exhibited in the Natural History Museum.

A dinosaur known only by a series of broken bones of the limbs and pelvis from Lower Greensand of Hythe has been described under the name of *Dinodocus mackesoni*, and is the sole representative of its genus. It may be allied to the Jurassic *Cardiodon* (*Cetiosaurus*). The large marine saurian known as *Polyptychodon continuus*, to which reference has been made in an earlier portion of this article, is typically from the Lower Greensand of Hythe and Maidstone. Another reptile from the latter locality is one of the long-necked plesiosauroians, named *Cimoliosaurus latispinus*. Fragments of the skull of a chelonian reptile from the Lower Greensand of Maidstone have been made the types of a genus and species under the name of *Protemys serrata* ; but their affinity is uncertain, and they appear to have been lost.

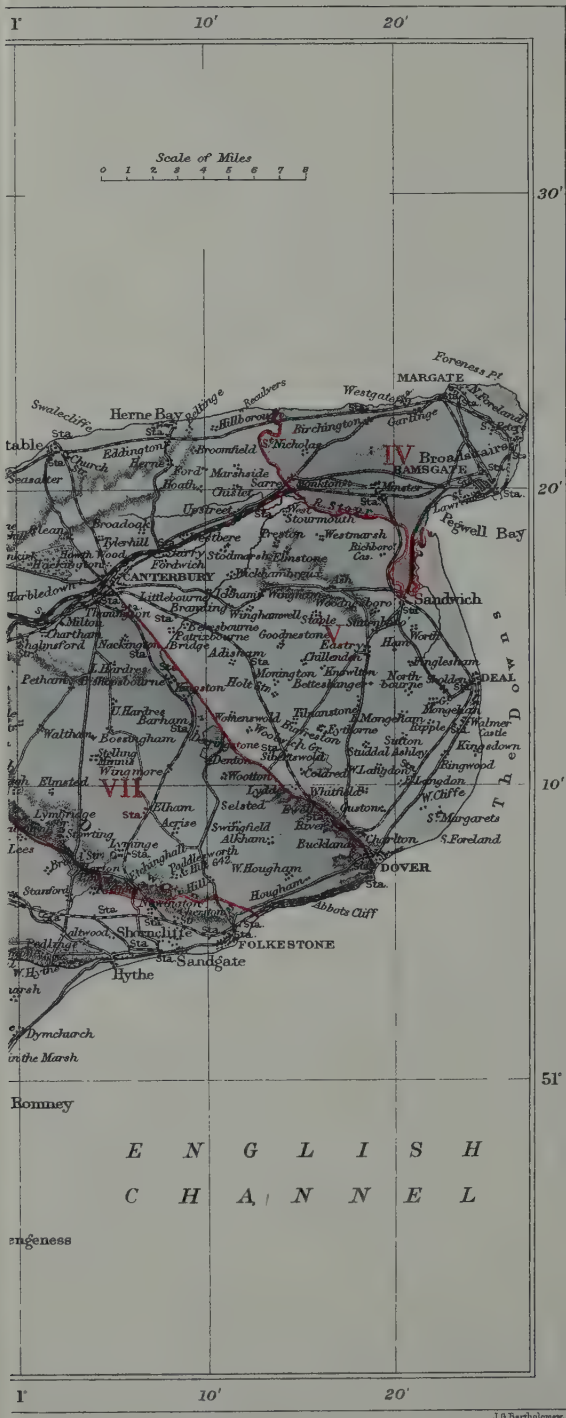
In addition to *Ischyodus thurmanni*, already referred to, the fishes of the Lower Greensand of the county are represented by two sharks, *Synechodus tenuis* from Maidstone, and a species from near Folkestone, which may be identical with the Swiss *Odontaspis studeri*. The former species is at present peculiar to Kent.

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Vertebrate remains from the Kentish Wealden, so far at least as published lists go, appear to be singularly few. The carnivorous dinosaur *Megalosaurus oweni*, typically from Sussex, is however represented in the British Museum collection by a specimen from Tunbridge Wells. A dinosaurian sacrum in the British Museum from the Hastings Sand of Southborough has been made the type of a genus and species under the name of *Thecospondylus horneri*, but its affinities are quite uncertain. Lastly the crown of a large dinosaurian tooth from the Wealden of the county has been referred by the present writer¹ to *Pelorosaurus conybeari*, a genus and species typified by a gigantic bone of the fore-limb (humerus) in the British Museum from the Wealden of Sussex.

Few vertebrate remains are more common in the Sussex Wealden than the knob-like teeth and large highly polished quadrangular scales of the fringe-finned ganoid fish *Lepidotus mantelli*, and similar remains have been recorded from the same formation at Tunbridge Wells.

¹ *Cat. Foss. Rept. Brit. Mus.* iv. 240.



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AS would naturally be expected, from its proximity to the continent, Kent possesses a remarkably rich flora, probably unrivalled in number of species by any other counties except Hampshire and Sussex. The latter has not yet been thoroughly explored, in spite of its general accessibility. Its critical plants, such as the brambles and hawkweeds, are still imperfectly known; and its much longer stretch of coast, together with its milder and warmer climate, permitting the survival of such western species as the Cornish moneywort (*Sibthorpia europæa*), *Bartsia viscosa*, etc., give it certain advantages in this respect, as compared with its eastern neighbour: so that, when the botany of both has been more minutely investigated, it is reasonable to suppose that Sussex will hold pride of place.

Kent is proverbially 'the garden of England,' but as regards at least the north-west portion it might more appropriately be called England's 'market-garden,' so considerable is the area devoted to raising fruit and vegetables. This preponderance of cultivation has caused a great disturbance of native plants; at the same time, there has been a compensating invasion of colonists and casuals, particularly in the suburban districts. Although there is still a fairly large area of heathy wastes, they are less extensive than those of Surrey; nor, with the exception of its chalk country, the richness of which is unequalled in Britain, and its littoral and estuarine preponderance, is Kentish botany, upon the whole, of equal interest to the explorer. At the same time, there is (we believe) no county where so many species can be observed during the course of a day's ramble in a few favoured spots, such as the valley of the Medway above Rochester.

In our recently published work¹ we estimated the total number of species (including *Characeæ*, here treated among the *Algæ*), not reckoning mere casuals or garden waifs, at about 1,160, 1,014 being considered as likely natives. This census is on the basis of the *London Catalogue*, ninth edition, in which a large number of critical species are admitted to equal rank with those of whose distinctness there is no question; a mode of treatment which is certainly open to some objection, but which seems, in the present state of knowledge, to be the best preparation for a system of grouping which cannot be successfully undertaken as yet. A few interesting additions have already been made, and others will no doubt

¹ *Flora of Kent*, by Frederick Janson Hanbury and Edward Shearburn Marshall (1899: F. J. Hanbury, 37 Lombard Street, E.C., price 12s. 6d.).

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be forthcoming in due time, mainly of course among the more intricate forms, which are 'caviare to the general,' and are accordingly neglected by most observers. Even in a relatively small fragment of a small country like our own the stores of Nature are not easily exhausted.

Considering the inroads of cultivation already alluded to, and in spite of the depredations of thoughtless or unprincipled collectors, which have told heavily upon the ferns and orchids, the list of proved extinctions is surprisingly small. Leaving on one side the case of very doubtful natives like *Echinophora spinosa* and ambiguities like *Elymus geniculatus*, the following seven alone are certainly lost. It is quite possible, indeed, that two or three of them may yet be rediscovered. *Eryngium campestre* was found near New Romsey in 1873, and still held its ground in 1880; but it has apparently since been buried under sand cast up by the sea. The cotton-weed (*Diotis candidissima*), recorded from Sheppey by Hudson in 1778, probably disappeared owing to an opposite cause, the northern coast of this island having been steadily eaten away by the waves. *Cyclamen bederæfolium*, formerly abundant in woods near Sandhurst (where, the late Mr. W. W. Reeves informed us, it looked perfectly wild), was exterminated by transplantation into gardens. The fen orchis (*Liparis Læselii*) appears to have been only once gathered at Ham Ponds near Sandwich, by Dillwyn (in 1802); it may yet exist, as there is a fenny tract suitable to it, and it is everywhere a plant of uncertain appearance. The soldier orchis (*Orchis militaris*), though formerly often reported owing to a confusion of names, *O. purpurea* being intended, can only be credited to the county on the evidence of a specimen from Northfleet in the herbarium of Dillenius at Oxford; the monkey orchis (*O. Simia*), on the contrary, used to be found not only in the Dartford district, but also near Faversham and Dover. *Carex depauperata* no longer exists in Charlton Wood, where it was originally discovered and described by Curtis.

The only British plant apparently restricted to Kent is the clove-scented broom-rape (*Orobanche caryophyllacea*), which is however reported from Suffolk on doubtful evidence.

The county was divided by H. C. Watson into two vice-counties, fifteen east Kent and sixteen west Kent, 'separated by the river Medway and its tributaries nearly up to Staplehurst, and thence by the high road through Cranbrooke to the border of Sussex, near Hawkhurst.' This arrangement was not serviceable for our purpose, nor was it found advisable, in planning out the districts, to adopt the excellent watershed system now generally in vogue, owing to local conditions. Our ten divisions may be briefly described as follows; they are partly natural, partly artificial:—

1. West: Along the Surrey border from near Keston to the Thames, which bounds it on the north as far as Erith. East: Through Crayford, Bexley, St. Mary Cray and Orpington to a little south of Keston. Thence north-west to the starting point. Mainly Lower Eocene (London clay, Woolwich and Thanet beds), with alluvium near the

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river, and a little chalk in the east and south. The growth of London and its suburbs has destroyed former stations for many good plants. About Woolwich, Plumstead and Erith aliens are especially numerous.

2. Lies east of district 1, south of which its border follows the Surrey boundary to a point between Tatsfield and Brasted. Hence it runs east along the Pilgrims' Way, past Chevening, Otford and Wrotham, to the Medway at Snodland; then, turning north, descends this river to its junction with the Thames; thence west to Erith. Principally chalk, with Lower Eocene beds, of which the Hundred of Hoo mainly consists, and a considerable amount of alluvium about the two estuaries. This is, botanically, the richest tract in Kent (and perhaps in all Britain), owing to its great diversity of soil and elevation and its submaritime coast. The southern half is well wooded and sparsely populated.

3. From Rochester down the Medway to Sheerness; thence (including Sheppey) along the sea to the channel separating Thanet from the mainland, and south to Sarr railway bridge; from this point west along the line, through Canterbury, Faversham and Sittingbourne to the Medway. Lower Eocene, with much alluvium in the north and a very little chalk. There are extensive salt marshes, particularly westwards, some of which are not yet thoroughly explored, and a large area of woodland stretches west and north of Canterbury. The flora, though interesting, is not very varied.

4. The Isle of Thanet; bounded on the south by the winding Stour. Entirely chalk, east from Birchington and round to Pegwell Bay, where there is a band of Lower Eocene (Thanet beds) extending for about four miles westward, with alluvium in the west and south. The smallest district. Excepting the coast from Sandwich to Ramsgate, it does not seem to have been much worked of late, and should repay further search.

5. From the sea, south of districts 4 and 3, to Canterbury; then south-east along the high road by Barham and Lydden to Dover, and north to Sandwich. Chalk, with extensive Lower Eocene beds about Canterbury and Ash; alluvium near the Stour and its tributaries, and a long stretch of blown sand from Deal to Sandwich. The coast-flora is very interesting, and has been thoroughly investigated; the central (and less attractive) part is not so well known.

6. Situated to the south of district 3; its border runs from Rochester south along the Medway to Burham, thence south-east below the downs, through Detling, Hollingbourne and Eastwell to Wye; following the railway north-east to Chilham, and thence north to the junction with district 3 near Lower Ensinge. Chalk, with outliers of Lower Eocene in the north, and some alluvium in the river valleys. Well wooded in the west and south-east, with a typical chalk flora.

7. Bordered on the north-east and north-west by districts 5 and 6, and from Dover to East Wear Bay by the Channel; thence west and north-west by the road through Beachborough, Postling and Pickersdean

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to Wye. Wholly chalk. There are large woods between Stouting and Bishopsbourne, as well as between Wye and Chartham. Several of the choicer orchids have their headquarters hereabouts.

8. The west and south boundaries are formed by Surrey and Sussex; on the north it is bordered by district 2 as far as Snodland, afterwards by district 6 as far as Grey Wethers; hence by the main road through Maidstone, Marden and Goudhurst to the Sussex boundary near Lamberhurst. A belt of gault occupies the extreme north, just below the chalk range; next comes the lower greensand series; south of this are the Weald clay and the Hastings sands. Here, and in districts 9 and 10, the geological formations run nearly due east and west, with a southerly trend as they approach the sea. The woodlands are chiefly in the north and south of this district. Tunbridge Wells and its neighbourhood produce many choice plants, and the southern tracts are prolific in brambles.

9. Bounded on the north by district 6, on the west by district 8, and on the south by Sussex, whence it follows the railway from Rye by Appledore and Ashford to Wye. This and the preceding district (of almost equal size) together occupy about a third of the county area. Their geology is much alike, but the gault is at its widest between Ashford and Wye, the lower greensand at its narrowest, with a corresponding extension in breadth of the Weald clay. Near Appledore and in the Rother valley alluvial deposits occur. There are some large woods, especially near Cranbrook. The southern sands should produce some novelties; formerly they were rather difficult of access, but the opening of the new railway has changed this.

10. District 7 lies to the east, and district 9 to the west. On the south-west it touches Sussex for a few miles, having the channel south and east. More than half of its area (the Romney Marsh and Dungeness neighbourhood) is alluvium, shingle or blown sand, the remainder being lower greensand—here broadening out again for some miles—gault and Weald clay. Between Shornecliffe and Dungeness many rarities occur, and the dykes still harbour relics of a considerable marsh vegetation, now much reduced by drainage.

The following notes are condensed from Mr. B. Daydon Jackson's very able summary of the history of Kent botany, which he most kindly contributed to the Introduction of our *Flora*.

The first notice of plants in this county is given by 'the father of English botany,' Dr. William Turner, Dean of Wells, in his *Names of Herbes* (1548), where he mentions *Glaucium flavum*, *Brassica oleracea* and *Critheum maritimum* (referred to in Shakespeare's *King Lear*) as growing on Dover cliffs; also the Spanish chestnut and butcher's broom. His *Herball* (1551-68) includes the earliest notice of the seakale (*Crambe maritima*).

Lobelius and Pena, in their *Stirpium Adversaria* (1571), added eight species, and the first-named, in his other writings, eight more.

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Clusius mentions *Blackstonia perfoliata*, *Gentiana Amarella*, *Calamintha parviflora*, *Salvia Verbenaca* and *Orchis latifolia*.

John Gerard, in his *Herball* (1597), gives eighty-three new records, mainly noted in districts 1 and 2.

Thomas Johnson (Gerard's reviser) was the first to write works dealing solely with Kent plants, adding altogether no fewer than 332 species, if the identifications are correct, which is doubtful in a few cases. He made two excursions into the county, the results of which were published in 1629 and 1632.

John Parkinson, author of the *Paradisus Terrestris* (1629), is responsible for seventeen first notices.

Christopher Merrett's *Pinax* (1666) contains twenty-six novelties.

John Ray in his various writings furnished twenty-nine new records.

John Blackstone's *Specimen Botanicum* (1746) has fifteen additions of his own, besides four others in a list of Faversham plants bequeathed by John Bateman.

Passing by various minor contributors, we come to William Hudson, whose *Flora Anglica* (1762; ed. ii. 1778) contains nineteen novelties.

Plantæ Favershamienses (1777), by Edward Jacob, was the pioneer of Kent local floras. It is a work of considerable merit, and enumerated about 140 fresh species.

William Curtis added eleven plants in his beautifully illustrated *Flora Londinensis* (1777-98).

This brings us down to the period of *English Botany* (1790-1814), by Sir J. E. Smith. It includes half a dozen Kentish novelties due to the author, and several others sent by correspondents.

L. W. Dillwyn's paper on plants of the Dover neighbourhood in the *Transactions of the Linnean Society* (1802) contains eleven first records, including such rarities as *Cnicus eriophorus*, *Liparis*, *Gladium* and *Poa bulbosa*. In 1805 (with Dawson Turner) he brought out the *Botanist's Guide*, which includes five additions for Kent.

Robert Pocock of Gravesend was an industrious field botanist, whose herbarium is now at the British Museum. His *Natural History of Kent* (1809) is the earliest authority for *Erysimum cheiranthoides* and *Setaria viridis*.

Of greater importance was T. F. Forster's *Flora Tonbridgensis* (1816), with no fewer than sixty-one new species; but its accuracy cannot always be relied on.

G. E. Smith's *Catalogue of the Plants of South Kent* (1829) deals mainly with the neighbourhood of Dover, Folkestone and Hythe, and embraces thirty-six first notices.

The *Flora Metropolitana* of Daniel Cooper (1835) furnished eighteen novelties, but its information is not always trustworthy.

M. H. Cowell's *Floral Guide to East Kent*, dealing chiefly with the plants of the Faversham neighbourhood, gives twenty-one first notices.

T. I. M. Forster in 1842 issued a supplement to his father's *Flora Tonbridgensis*, soon (1845) to be followed by Edward Jenner's *Flora of*

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Tunbridge Wells, which sheds light upon some defects in the earlier book. Among the chief Kentish botanists of this period were Edward Forster, William Borrer, Joseph Woods and N. J. Winch.

The *Phytologist* (1841-54) often refers to plants of the county. Its new series (1854-63) includes several discoveries by W. Pamplin and A. Irvine.

T. B. Flower's *Flora Thanetensis* (1847) contains numerous errors.

In his various books (1835-74) H. C. Watson brought to light several important additions, made by himself or others.

Professor Babington, A. G. More and W. W. Reeves all contributed to the investigation of the county. A still more energetic explorer was J. T. Syme (afterwards Dr. Boswell).

Since 1863 the recognized organ of British botanists has been the *Journal of Botany*. Its present editor, Mr. James Britten, has always readily given us the benefit of his assistance and advice.

While preparing the *Flora of Kent*, began in 1872 but not completed until 1899, we were fortunate in securing the aid of many willing helpers; but we have not space to name them all here. Of those who have passed away, the following may be mentioned: W. W. Newbould, Henry Trimen, F. M. Webb, Charles Darwin, G. Dowker and G. B. Wollaston. From those who happily still survive we select: J. G. Baker, W. H. Beeby, Arthur Bennett, J. S. Clarke, G. Claridge Druce, J. F. Duthie, H. and J. Groves, E. M. Holmes, B. Daydon Jackson, W. R. Jeffrey, H. Lamb, Maxwell T. Masters, J. Cosmo Melvill, Bishop Mitchinson, W. Moyle Rogers, C. E. Salmon, C. W. Shepherd, G. C. Walton, Sydney Webb, W. Whitwell and A. H. Wolley-Dod.

Instead of drawing up separate lists of rarities for each district, we propose to briefly mention the more uncommon plants in various Orders, which will give a better notion of the county vegetation as a whole.

RANUNCULACEÆ.—*Thalictrum flavum*, L. (meadow rue) is most plentiful in the Medway valley. *T. collinum*, Wallr. may have been found by Parkinson on Margate cliffs; if so, it has long since disappeared. A blue-flowered form of *Anemone nemorosa*, L. (wood anemone) grows near Tunbridge Wells. *A. ranunculoides*, L. is recorded by Hudson from Wrotham, and *A. apennina*, L. has been observed at Trottescliffe and Tonbridge; but they are not natives. *Adonis autumnalis*, L. is well established in chalky fields, though apparently decreasing; and *Myosurus minimus*, L. is thinly but generally distributed. Among the *Batrachium* section of *Ranunculus*, *R. peltatus*, Schrank; *R. heterophyllus*, Weber; *R. circinatus*, Sibth.; *R. trichophyllus*, Chaix.; and *R. Drouetii*, Godr. are all more or less frequent. (Messrs. Groves found a new hybrid, *R. Baudotii* × *Drouetii*, in Plumstead Marshes.) *R. Baudotii*, Godr. also abounds in many sub-maritime localities. *R. lutarius*, Bouvet (*intermedius*, Hiern, non Knaf) has only been gathered near Tunbridge Wells; and but three stations in districts 8 and 9 are known for *R. Lenormandi*, F. Schultz. Among the true buttercups, *R. Lingua*, L. and *R. sardous*, Crantz

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(*birsutus*, Curt.) are locally frequent ; *R. parviflorus*, L. having a dozen localities in six districts. *Helleborus viridis*, L. and *H. fœtidus*, L. are truly wild in woods on chalk, the latter being confined to districts 2 and 6. *Aquilegia vulgaris*, L. (columbine) is also native and locally abundant. *Delphinium Ajacis*, Reichb. (larkspur), though found in every district, is hardly more than a casual.

BERBERIDEÆ.—The barberry (*Berberis vulgaris*, L.), almost restricted to hedges in Kent, is rare and not indigenous.

NYMPHÆACEÆ.—Both the white and the yellow water lily are frequent, except near London. The former has its headquarters in the Weald.

PAPAVERACEÆ.—*Papaver somniferum*, L. (opium poppy) is naturalized on the chalk, to which the rare *P. Lecocqii*, Lamotte is entirely, and the local *P. hybridum*, L. mainly confined. *Meconopsis cambrica*, Vig. (Welsh poppy) occurs (planted or escaped) at Hawkhurst, and *Glaucium flavum*, Crantz is fairly common on the coast. *Cbelidonium majus*, L. (celandine), though plentiful, usually grows near houses and in roadside hedges.

FUMARIACEÆ.—*Neckeria claviculata*, N. E. Brown (*Corydalis*, DC.), though frequent in district 1, is scarce elsewhere. *Fumaria pallidiflora*, Jord. has been found casually but twice ; *F. Boræi*, Jord., *F. confusa*, Jord., and *F. muralis*, Sonder are better established, though uncommon. *F. densiflora*, DC. and *F. parviflora*, Lam. abound in many chalky fields ; but *F. Vaillantii*, Loisel. is recorded only from Chatham, Cuxton, Wouldham, Bredhurst and Maidstone.

CRUCIFERÆ.—*Matthiola incana*, R. Br. (hoary stock) has been found on cliffs at Ramsgate and Broadstairs ; *Cheiranthus Cbeiri*, L. (wallflower) is also naturalized on the cliffs of Thanet, and from Folkestone to the South Foreland. *Nasturtium sylvestre*, R. Br. and *N. amphibium*, R. Br. are both scarce ; *N. palustre*, DC. being uncommon outside districts 8 and 9. *Barbarea arcuata*, Reichb. has only one ascertained habitat, near Sittingbourne ; and *B. intermedia*, Bor. but two, at Leeds and Penshurst. *B. præcox*, R. Br. (American cress) seems to be spreading. *Arabis birsuta*, Scop. keeps to the chalk, and even there is comparatively rare ; *A. Turrata*, L. long since disappeared from a wall at Lewisham, where Martyn discovered it ; and *A. perfoliata*, Lam. formerly frequent on sand near London, has only been met with lately at Hayes, Chislehurst, Chelsfield and Stourmouth. *Cardamine amara*, L. and *C. flexuosa*, With. are local but not rare ; *C. impatiens*, L. grows at Maplehurst and in the Eden valley, about Edenbridge and Penshurst ; *C. bulbifera*, R. Br. (*Dentaria*, L.) being found here and there in districts 8 and 9. *Draba muralis*, L. (a recent addition) occurs on bare chalky ground near the old racecourse, Wye ; Prof. Percival suspects it to have been introduced with conifers from Carlisle, but on grounds which appear to us insufficient. *Erophila brachycarpa*, Jord. must surely occur in other places besides Faversham, and between Deal and Sandwich. We have seen no specimens of *Cochlearia officinalis*, L. (common scurvy-grass), recorded on good authority from Greenwich and Strood ; *C. danica*, L. has but three

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stations in Kent; *C. anglica*, L., however is plentiful northwards by tidal rivers and salt marshes. Its var. *gemina*, Hort (*Hortii*, Syme), erroneously assumed to be the type in our flora, has occurred about Woolwich and Queenborough, and may be not uncommon. *Sisymbrium Sophia*, L. is scarce except in the north. *Erysimum cheiranthoides*, L. may be native here and there on river sides, but is usually a colonist or casual, and rather scarce. *Brassica oleracea*, L. (wild cabbage) is certainly indigenous on the southern cliffs from Folkestone to the South Foreland; and *B. Sinapioides*, Roth (*nigra*, Koch [black mustard]) is equally so on the coast, though only a colonist inland. *Diplotaxis tenuifolia*, DC. has many natural stations; and *D. muralis*, DC. (first observed in 1778) has spread from Thanet over many parts of the north and east. *Lepidium latifolium*, L., though decreasing, still occurs about Upnor, Broadstairs, Sandwich and Folkestone; *L. hirtum*, Sm. (*Smithii*, Hooker), a plant of light soils, is uncommon; but *L. Draba*, L. accidentally introduced at Ramsgate about a century ago, has become abundant in many places. *Iberis amara*, L. (candytuft) used to be found at Shooters Hill, Cobham, Aylesford and Deal. *Hutchinsia petræa*, planted (by Dillenius?) on a wall at Eltham, is extinct. *Teesdalia nudicaulis*, R. Br., abundant on the shingly beach at Lydd and Dungeness, also occurs about Kingsdown, Stourmouth and Cranbrook. *Crambe maritima*, L. (seakale) is now almost limited to the coast between Walmer and Folkestone. *Raphanus maritimus*, Sm. has but one station, at Broadstairs.

VIOLACEÆ.—*Viola palustris*, L. has its main range in districts 8, 9. *V. odorata*, L. (sweet violet) is certainly native on the chalk. While *V. ericetorum*, Schrad. (*canina*, auct.) is fairly general on dry heaths, *V. lactea*, Sm. has only been observed about Tunbridge Wells, and between Leigh and Penshurst Park.

POLYGALÆ.—*Polygala oxyptera*, Reichb. is scarce, *P. calcarea*, F. Schultz locally abundant, on the downs; to which also *P. austriaca*, Crantz (only found outside Kent in one British station) is restricted. It has been gathered near Wye, Charing, Hartlip and Shoreham, and probably occurs elsewhere.

FRANKENIACEÆ.—*Frankenia lævis*, L. (sea heath) may be found here and there from Sheppey to New Romney.

CARYOPHYLLÆ.—*Dianthus Armeria*, L. (Deptford pink), though not rare, is decreasing; *D. deltoides*, L. (maiden pink) being very scarce. *D. plumarius*, L. and *D. Caryophyllus*, L. (aliens) linger on two or three ruins. *D. prolifer*, L. is native about Hythe. *Silene conica*, L. abounds on Deal sandhills and at Romney Warren; *S. anglica*, L. being strangely rare, and *S. quinquevulnera*, L. merely sporadic. *S. nutans*, L. (Nottingham catchfly) has a considerable range in the south-east; its near ally *S. italica*, Pers., long known near Dartford, also grows at intervals from Dungeness to St. Margaret's Bay. *S. noctiflora*, L. is not well established, except in Thanet. *Cerastium quaternellum*, Fenzl (*Mænchia erecta*, Sm.) is local and of uncertain appearance; but *C. arvense*, L. occurs frequently on the chalk. *Stellaria palustris*, Retz (*glauca*, With.) has been found

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near Deal and Tunbridge Wells; *S. umbrosa*, Opiz at Darenth, Elmsden and Folkestone. *Sagina maritima*, Don, frequent from Hythe to Sandwich, has only been noticed elsewhere in Sheppey and at Herne Bay. *S. ciliata*, Fr. is doubtless often overlooked in sandy ground; about sixteen stations are known for it. The only certain locality for *S. subulata*, Presl is at Blackheath; while *S. nodosa*, Fenzl is restricted to the neighbourhood of Margate, Sandwich, Sandgate and Romney. The usual Kentish form of *Lepigonum salinum*, Kindb. is the glandular *L. neglectum*, Kindb.

HYPERICINÆ.—*Hypericum Androsæmum*, L. (tutsan) occurs in every district, and is rather common in the south. *H. dubium*, Leers has but six specified stations, var. *maculatum*, Bab. being reported from Hawkhurst. *H. montanum*, L. prefers the border line between sand and chalk; it is rare, and only found in districts 1, 2, 3, 8. *H. Elodes*, L. grows about Keston and Chislehurst, around Tunbridge Wells, on Hothfield Heath, and at Collier's Green; also at Willesborough and Westenhanger.

MALVACEÆ.—*Althæa officinalis*, L. (marsh mallow) may still be found in a good many sub-maritime spots (it is common in Romney Marsh); and *A. hirsuta*, L. holds its own about Cobham and Cuxton, where it was discovered in 1792.

LINEÆ.—*Radiola linoides*, Roth (all-seed), though locally frequent, has not been seen in districts 2, 4, 6, 7. *Linum angustifolium*, Huds. is most plentiful in the south and east, and appears to be absent from district 1.

GERANIACEÆ.—*Geranium pratense*, L. (meadow crane's-bill) has been found sparingly in all but three of our divisions; *G. pyrenaicum*, Burm. fil., though more common, is a doubtful native. *G. rotundifolium*, L. (rare and local) has over a dozen stations, several being in the north-west; *G. lucidum*, L. being rather more frequent, though local. The var. *purpureum* of *G. Robertianum*, L. (herb Robert) abounds on the shingles of Dungeness; it also grows at Hythe, Kingsdown, and between Dover and Folkestone. *Erodium moschatum*, L'Hérit. is possibly native in Thanet, near Hythe, and at Sandgate; *E. maritimum*, L'Hérit. has been gathered near Deal and on the walls of Sandgate Castle, but not recently. *Oxalis Acetosella*, L. (wood sorrel), var. *subpurpurascens*, DC., with rose-pink flowers, used to grow at Chislehurst (Gerard), and has lately been found between Seal and Ightham. *Impatiens biflora*, Walker (*fulva*, Nutt.) is naturalized near Catford Bridge, Lewisham and Darenth.

RHAMNÆ.—*Rhamnus catharticus*, L. (buckthorn), common on chalk, grows in every district; the sand-loving alder buckthorn (*R. Frangula*, L.) is frequent in districts 1, 8, 9.

LEGUMINOSÆ.—*Genista pilosa*, L. has but one Kentish station (Wrotham Heath); *G. anglica*, L. (needle greenweed) being also comparatively scarce, owing to the paucity of damp commons, a remark which applies to *Ulex nanus*, Forster. *Trigonella purpurascens*, Lam., rare inland, sometimes grows in profusion on the coast, like the choicer *Medicago denticulata*, Willd. and *M. minima*, Desr. *M. sylvestris*, Fr.

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was discovered in 1896 in the Tunbridge Wells neighbourhood, and reported to us as a true native. *Trifolium ocbroleucon*, Huds. has three alleged stations (near Greenwich, between Northfleet and Gadshill, and at Sutton Valence); but we have seen no specimen. *T. squamosum*, L. (*maritimum*, Huds.) and *T. glomeratum*, L. are locally frequent in the north, and on the east and south coasts; *T. suffocatum*, L. being restricted to Chislehurst Common, Blackheath, Upnor, and sandy or gravelly shores from Lydd to Sandwich. *Lotus tenuis*, Wald. & Kit. is fairly frequent on stiff soils; but *L. angustissimus*, L. has only twice been obtained, viz. in the Isle of Grain and near Gravesend. *Coronilla varia*, L. occurs in a rough wood at Goodneston and on a hedge bank at Farleigh, no doubt introduced; and *Astragalus glycyphyllos*, L. (milk vetch) grows in many thickets on the chalk. Sainfoin (*Onobrychis viciæfolia*, Scop.), common on the downs, is probably often indigenous. *Vicia gracilis*, L. has been found at Cobham, Herne Bay, between Whitstable and Canterbury, and at Southborough. *V. sylvatica*, L. (wood vetch) possesses twenty stations; while *V. lutea*, L. is wild only about Lydd and Dungeness. *V. lathyroides*, L. is locally plentiful on the coast; but *V. bithynica*, L. only occurs at Frinsbury, Hoo, Darenth Wood, Upnor, Deal, Folkestone and Sandwich. *Lathyrus Aphaca*, L. has ten localities vouched for; *L. Nissolia*, L. being frequent in many parts. *L. hirsutus*, L. is considered by Mr. Holmes to be native in a wood at Southborough, and *L. sylvestris*, L. is not uncommon eastwards; but *L. latifolius*, L. (everlasting pea) is only an occasional escape from gardens. *L. maritimus*, Bigel. is now confined to the shingles near Walmer and Dungeness.

ROSACEÆ.—The brambles of Kent are still in need of much examination, few neighbourhoods having been thoroughly worked. Of those known to be more or less common we may mention *Rubus Idæus*, L. (raspberry); *R. Lindleianus*, Lees; *R. rhamnifolius*, L.; *R. pulcherrimus*, Neum.; *R. argentatus*, P. J. Muell.; *R. rusticanus*, Merc. (*fruticosus*, Sm.; *discolor*, Bab.); *R. pubescens*, Wh., var. *subinermis*, Rogers; *R. macrophyllus*, Wh. & N.; *R. Sprengelii*, Wh.; *R. leucostachys*, Schleich.; *R. radula*, Wh.; *R. Babingtonii*, Bell Salt.; *R. scaber*, Wh. & N.; *R. fuscus*, Wh. & N. (district 1); *R. foliosus*, Wh. & N.; *R. rosaceus*, Wh. & N.; *R. dasyphyllus*, Rogers (*pallidus*, Bab.); *R. viridis*, Kalt.; *R. hirtus*, Wald. & Kit.; *R. dumetorum*, Wh. & N.; *R. corylifolius*, Sm.; and *R. cæsius*, L. (dewberry). Other species are hitherto localized as follows: *R. fissus*, Lindl.: Hayes, Chislehurst and St. Paul's Cray Commons; Paddlesworth (district 7). *R. suberectus*, And.: Bigberry and East Blean Woods; Willesborough. *R. plicatus*, Wh. & N.: Chislehurst and St. Paul's Cray Commons; Dartford; Tunbridge Wells. *R. Rogersii*, Linton: Hayes Common. *R. opacus*, Focke: Preston (district 5). *R. affinis*, Wh. & N.: near Plumstead (the other records are probably erroneous). *R. imbricatus*, Hort: Tunbridge Wells. *R. carpinifolius*, Wh. & N.: Hayes and Chislehurst Commons; Barming Heath. *R. incurvatus*, Bab.: Tunbridge Wells. *R. Bakeri*, F. A. Lees: Hayes and Chislehurst Commons. *R. Selmeri*, Lindeb.: Dartford Heath; Fawke Common. *R.*

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gratus, Focke: Plumstead Common; Thorndean Woods, etc. (district 3). *R. micans*, Gren. & Godr. (*adscitus*, Genev.): Ryarsh; Tunbridge Wells. *R. hirtifolius*, Muell. & Wirtg.: Paddlesworth (district 7). *R. pyramidalis*, Kalt.: East Wickham, Highlands, Mereworth, Ryarsh, Sevenoaks. *R. mucronatus*, Blox.: near Eltham. *R. Gelertii*, Frid., var. *criniger*, Linton: Ryarsh, Leybourne. *R. anglosaxonicus*, Gelert: Shooters Hill; Ryarsh; Dartford Heath (var. *raduloides*, Rogers). *R. lasiocladus*, Focke: Paddlesworth; Tunbridge Wells; Sevenoaks (var. *angustifolius*, Rogers). *R. melanoxydon*, Muell. & Wirtg.: Bexley Wood (Wolley-Dod, 1901). *R. infestus*, Wh.: Tunbridge Wells; Willesborough. *R. Drejeri*, G. Jensen: Plumstead Common; Blean Wood. *R. podophyllus*, P. J. Muell.: Plumstead Common. *R. echinatus*, Lindley: Bostal Heath, West Wood Lane and Eltham; Strood, Trottescliffe. *R. oigoclados*, Muell. & Lef. (var. *Newbouldii* (Bab.): Tunbridge Wells; Leybourne; Wrotham Heath. *R. rudis*, Wh. & N.: Chelsfield; frequent about Ryarsh and Sevenoaks; Ham Street. *R. Lejeunei*, Wh. & N., var. *ericetorum*, Lef.: Eltham. *R. Bloxamii*, Lees: Barming, Highlands and Leybourne; Wrotham Heath. *R. pallidus*, Wh. & N.: Shooters Hill; East Wickham; var. *leptopetalus*, Rogers: St. Paul's Cray; Chislehurst; Shooters Hill. *R. longithyriger*, Bab.: Shooters Hill; Eltham. *R. Powellii*, Rogers: Shooters Hill. *R. adornatus*, P. J. Muell.: Keston; Leybourne, Malling, Bitchet Common; Sandling Park. *R. Koehleri*, Wh. & N.: Beckenham, Chislehurst and Shooters Hill; Halstead; Canterbury; Wye. *R. Marshalli*, Focke & Rogers: Bostal Heath; Tunbridge Wells. *R. hostilis*, Muell. & Wirtg.: Ryarsh; Offham; Tunbridge Wells. *R. Bellardi*, Wh. & N.: Fordwich; near Ryarsh; Sandling Park (var. *dentatus*, Bab.). *R. serpens*, Wh.: Halstead; Shoreham; Tunbridge Wells; Shooters Hill (var. *R. rivularis*, Muell. & Wirtg.). *R. britannicus*, Rogers: Keston Common; Orpington; near Ryarsh. *R. Balfourianus*, Blox.: Shooters Hill; Wye; Tunbridge Wells; Ashford; Ham Street. The American *R. spectabilis*, Pursh is naturalized near Sandling Junction, and *R. laciniatus*, Willd., another escape, has been gathered on Chislehurst Common.

Geum rivale, L. (water avens) was said by Jacob (1777) to grow at Hothfield, and is not unlikely to occur. *Fragaria elatior*, Ehrh. (Hautbois strawberry), has become established in a few places. *Potentilla procumbens*, Sibth., often overlooked, is pretty common; while *P. argentea*, L., though found in all the divisions, is only plentiful in district 1. *P. palustris*, Scop. (*Comarum palustre*, L.), perhaps extinct at Keston, has also been noted in Minster Marshes (district 4), near Ashford, and by the ponds at Dungeness. *Alchemilla vulgaris*, L. (lady's mantle) has several stations in district 8, but is very rare elsewhere. *Agrimonia odorata*, Miller, only noticed at Plumstead, Fordwich, Tunbridge Wells, Pounds Bridge, and near Penshurst, is likely to prove more frequent in the Weald.

The roses are fairly well represented. *Rosa pimpinellifolia*, L. (burnet rose) grows chiefly on the downs; of its hybrids (*R. involuta*, Sm., and vars.), *R. pimpinellifolia* × *rubiginosa* has been found at Boxley Warren, *R. pim-*

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pinellifolia × *tomentosa* at Snodland, Halling, Trottescliffe, Crockham Hill and Southborough. Of *R. rubella*, Sm. (perhaps also a *pimpinellifolia* hybrid), an unlocalized west Kent specimen is in E. Forster's herbarium at the British Museum. Vars. *comosa*, Rip. and *jenensis*, M. Schulze of *R. rubiginosa*, L. (common on chalk) occur at Halling and Boxley Warren respectively; *R. micrantha*, Sm., var. *bystrix* (Léman) grows on Dartford Heath, and var. *permixta* (Dés.) at Upper Halling, Halstead, and Boxley; *R. micrantha* × *rubiginosa* (?) at Boxley Warren. *R. tomentosa*, Sm., *R. obtusifolia*, Desv. and its var. *tomentella* (Léman), and *R. systyla*, Bast. are all frequent; whereas *R. glauca*, Vill. is only recorded from Chelsfield and Cuxton, and *R. sepium*, Thuill. from Adisham, and between Chilham and Crundell. *Pyrus torminalis*, L., *P. communis*, L. (wild pear), and *P. germanica*, Hooker fil. (*Mespilus*, L. [medlar]) are quite local; Darenth Wood being the sole station for *P. pinnatifida*, Ehrh. (probably *P. Aria* × *Aucuparia*).

SAXIFRAGÆ.—*Saxifraga granulata*, L., known for six divisions, is not uncommon in districts 1, 2, 8; *Chrysosplenium alternifolium*, L., being the scarcer of our two species, though it has several stations in districts 8, 9, 10.

CRASSULACEÆ.—*Cotyledon Umbilicus*, L. (wall pennywort), always rare, is mostly extinct, but was observed lately near Chilham. *Sedum Telephium*, L. (orpine) and *S. anglicum*, Huds. are locally plentiful; but *S. reflexum*, L. is usually if not always introduced (the Wrotham and Ightham stations may be exceptions; the plant found there was apparently *S. albescens*, Haw.).

DROSERACEÆ.—*Drosera rotundifolia*, L. (sundew), for lack of suitable situations, is of scanty occurrence, and *D. intermedia*, Hayne appears to be absent.

HALORAGÆ.—*Myriophyllum verticillatum*, L. has a fairly general distribution; *M. alterniflorum*, DC., only recorded from Preston (district 5), Ham Ponds and Appledore, should also prove to be not uncommon inland. *Callitriche obtusangula*, DC. is frequent near the sea; but the only home of *C. truncata*, Guss. is at Westerham.

LYTHRACEÆ.—*L. Hysopifolia*, L. has occurred between South Norwood and Elmers End, near Rochester and Faversham, and possibly by the old canal between Gravesend and Strood.

ONAGRACEÆ.—*Epilobium lanceolatum*, Seb. and Maur. grows between Chislehurst and Bickley, in Woolwich Arsenal, at Swanscombe and River Hill, and between Whitstable and Canterbury. *E. roseum*, Schreb., *E. adnatum*, Griseb. (*E. tetragonum*, Curt., an L.?), and *E. palustre*, L. are pretty generally distributed; a remark probably applying to *E. Lamyi*, F. Schultz, which is a perfectly distinct but imperfectly known species. Several hybrids have been met with. *Oenothera biennis*, L. (evening primrose) is rather freely naturalized; *O. odorata*, Jacq. being apparently well established at Richborough and Ightham.

UMBELLIFERÆ.—*Echinophora spinosa*, L., reported by old writers from Faversham, Whitstable, Thanet and Sandwich, was (if correct) only

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a ballast plant. *Smyrnium Olusatrum*, L. (Alexanders) is frequent and native near tidal waters. *Bupleurum rotundifolium*, L. (hare's-ear) has its chief range on the chalk in district 2; *B. tenuissimum*, L. being a fairly common littoral species. *Falcaria vulgaris*, Bernh., a denizen or alien, grows in chalky fields at Birchington and Wingham. *Sium latifolium*, L. has disappeared from many of its old localities, but remains fairly common in and near Romney Marsh. *Pimpinella major*, Huds. (*magna*, L.) is unusually plentiful in Kent (both type and var. *dissecta*, N. E. Br.). *Crithmum maritimum*, L. (samphire), frequent from Deal to Folkestone, is also recorded from Halstow and Romney. *Ænanthe silaifolia*, Bieb. (easily overlooked), grows at Chiddingstone, Sarre, between Sheerness and Queenborough, and between Seabrooke and Appledore; *Æ. Lachenalii*, C. Gmel. (in salt marshes) and *Æ. Phellandrium*, Lam. (especially in the Weald) occur freely; but *Æ. fluviatilis*, Coleman is restricted to streams in east Kent. *Peucedanum officinale*, L., lost from the Thames marshes since Ray's time, can still be obtained about Faversham, Whitstable and Herne Bay. The localities for *Daucus gummifer*, Lam. are in Thanet, and at Dover and Folkestone. *Caucalis daucoides*, L. occurs sparingly in district 2, and was formerly found between Rochester and Maidstone; *C. arvensis*, Huds., though not very common, grows in all the districts.

CAPRIFOLIACEÆ.—*Sambucus Ebulus*, L. (dwarf elder) is reported in over twenty localities; and *S. nigra*, L. (var. *laciniata*, L.) in eleven. *Lonicera Caprifolium*, L. (probably bird sown) grows at Bromley, Shortlands, Knockholt and Upper Halling.

RUBIACEÆ.—*Rubia peregrina*, L. (wild madder) appears to be confined to the south coast, about Dover, Folkestone and Hythe. *Galium erectum*, Huds. has been observed sparingly in seven districts; while *G. uliginosum*, L. is rare, except in district 1. *G. anglicum*, Huds. is (or was) found at Eltham, Bromley, Dartford, Crayford, Cobham, Farmingham and Lydden Spout (near Dover); *G. tricornis*, Stokes being rather common in chalky soil.

VALERIANEÆ.—*Valeriana dioica*, L., rare in the dry chalk districts, is not unfrequent elsewhere. *V. Mikaniæ*, Syme, hitherto known for certain only about Halling and Wye, should prove to be more frequent in copses on the chalk. *Centranthus ruber*, DC. (spur valerian) is abundantly naturalized; but *C. Calcitrapa*, Dufr. may be extinct at Eltham. *Valerianella carinata*, Loisel. seems to be native, at least in some of its stations, which are as follows: between West Wickham and Keston, Upper Deal, between Wrotham and Ryarsh, Sutton Valence, and Boughton Quarries, Linton. *V. rimosa*, Bast. (*Auricula*, DC.) has only occurred in cornfields about West Wickham, Keston and Hayes, near Cobham, and between Oare and Sheppey.

COMPOSITÆ.—*Pilago spathulata*, Presl and *F. minima*, Fr. are both rather uncommon. *F. gallica*, L., formerly found about Dartford, was probably introduced with the crop. *Gnaphalium sylvaticum*, L. is generally but locally distributed. *Inula Helenium*, L. (elecampane), a very doubtful native, occurs quite rarely; *I. crithmoides*, L. (golden samphire)

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has several stations in district 3, and was recently discovered at Stoke (district 2). *Pulicaria vulgaris*, Gærtn. is on record from Lewisham, Mottingham, Faversham, Hernhill, Redleaf and Snodland. Abundant in the Tunbridge Wells neighbourhood, *Anthemis nobilis*, L. (chamomile) is scarce elsewhere. *Petasites fragrans*, Presl spreads fast; and *P. officinalis*, Mœnch (butterbur) is frequent in the Weald. *Senecio viscosus*, L., a common weed near London, is clearly native from Dungeness to Hythe. *S. squalidus*, L. was originally introduced from Oxford by Dr. Maxwell Masters to the old city wall at Canterbury. *S. campestris*, DC. only occurs on the downs above Burham. *Arctium nemorosum*, Lej. and *A. intermedium*, Lange are not uncommon, though less plentiful than *A. majus*, Bernh. *Cnicus eriophorus*, Roth has apparently decreased, and some of its alleged localities are doubtful; it has chiefly occurred near the south-east coast. *C. pratensis*, Willd., like its usual companions, is quite scarce in Kent; on the other hand, the Scotch thistle (*Onopordon Acanthium*, L.) has been found in every division, with many stations in districts 2, 3. The alien milk thistle (*Mariana lactea*, Hill; *Silybum Marianum*, Gærtn.) occurs fairly often; but *Serratula tinctoria*, L. (saw-wort) is quite rare, except about Keston, Bromley, Cranbrook and Hawkhurst. *Centaurea Jacea*, L. and *C. solstitialis*, L. have no claim to be native; but *C. Calcitrapa*, L. is probably so on the coast. *Arnoseris pusilla*, Gærtn. has been collected only in sandy fields at Bexley and Sutton Valence. *Crepis fœtida*, L. was noted for a good many suburban stations; but it is now lost in several of them, and may be found principally about Walmer and Hythe. *C. taraxacifolia*, Thuill., indigenous on the chalk, abounds in Kent more than in any other English county; which is also probably the case with *C. biennis*, L. The hawkweeds have not yet been properly worked out. *Hieracium murorum*, L. (usually var. *pellucidum*, Læst.) is frequent in the sandy parts of the Weald. *H. vulgatum*, Fr. var. *glauco-virens*, Dahlst. grows at Vill of Dunkirk (district 3) and Stone Street (district 7); var. *maculatum* (Sm.), an alien, has occurred on a wall at Sydenham and on Walmer beach. *H. sciaphilum*, Uechtr. (*H. sylvaticum*, Sm.?) is frequent on sand, especially in districts 8, 9; like *H. rigidum*, Hartm., of which vars. *acrifolium*, Dahlst. and *scabrescens*, Johanssen are probably the usual forms in Kent; var. *tridentatum* (Fr.) has been gathered in Bedgebury Woods near Cranbrook. *H. cantianum*, F. J. Hanb., found near Tunbridge Wells and Cranbrook, should occur in a good many places. *H. boreale*, Fr. is quite common. Of *H. umbellatum*, L., frequent on heaths and in open woodlands, var. *monticola* (Jord.) is only known from Darenth Wood; while var. *coronopifolium* (Bernh.) occurs near Maidstone and Leybourne. *Hypochaeris glabra*, L. used to be found on Blackheath and Woolwich Warren; it still grows about Tunbridge Wells, Sevenoaks, Rodmersham, Deal, Sandwich and Romney, sometimes in company with var. *Balbisi* (Loisel.). *Taraxacum erythrospermum*, Andr. (*T. corniculatum*, DC.?) often abounds on light sand. The type of *T. palustre*, DC. seems to be much rarer than var. *udum* (Jord.); which, in spite of its name, is by no

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means confined to wet places, being plentiful on the downs in district 2, and doubtless elsewhere. *Lactuca virosa*, L., though local, has many more localities than *L. Scariola*, L., found sparingly in the maritime or sub-maritime portions of districts 1, 2, 3, 7. *L. saligna*, L. grows in a few places near the Thames; about Sheerness, Herne Bay, Whitstable and Seasalter; and at Wouldham. *Sonchus palustris*, L. (marsh sow-thistle) is almost restricted to the Thames and Medway valleys (there is an outlying station at Ryarsh Wood); the alleged east Kent localities were most likely errors, as large states of *S. arvensis* growing in marshes have often been mistaken for this species. *Tragopogon pratense*, L., var. *Symei*, Ar. Benn. (*grandiflorum*, Bosw.) has been observed at Sydenham, Cobham and Wye; *T. porrifolius*, L. (salsify) being occasionally found more or less naturalized.

CAMPANULACEÆ.—*Wahlenbergia hederacea*, Reichb. (ivy-leaved bell-flower) has occurred on the bogs in district 1; about Chevening, Knockholt, Down, Cudham and Westerham; and at Seal Chart. *Phyteuma orbiculare*, L., locally plentiful in Surrey and Sussex, is very rare in Kent, being restricted to a few stations in district 2 and the cliffs between Walmer and St. Margaret's; it appears to be extinct at Beacon Hill near Faversham. *Campanula glomerata*, L. (clustered bellflower), though abundant in district 2, has a very thin distribution over the rest of the chalk country; *C. latifolia*, L. (giant bellflower) is recorded only from Cobham, Rainham and Canterbury; *C. Rapunculus*, L. from Bexley, North Cray, Crayford, Dartford, Cobham and Harrietsham; while *C. patula*, L. has but two stations, near Bexley and at Cobham.

VACCINIACEÆ.—The bilberry (*Vaccinium Myrtillus*, L.) has only seven definite localities outside districts 8, 9, where it is locally abundant; and the cranberry (*Schollera Oxycoccus*, Roth, *V. Oxycoccus*, L.) possesses a solitary station at Oldborough (district 8).

ERICACEÆ.—*Erica Tetralix*, L. (cross-leaved heath) is very rare, except on the moist sands of districts 1, 8, 9; *E. cinerea*, L. (purple heath) being also scarce in districts 2, 7, 10, and quite absent from districts 3 to 6. *Pyrola rotundifolia*, L. has one west Kent habitat in Joyden's Wood, Bexley; it also occurs at Millstead (district 6), and in seven parishes—mostly on the chalk—between Stouting and Stourmouth (districts 5, 7). *P. minor*, L. has been found between Penshurst and Maidstone, as well as near Eastwell, Nackington, Wye and Stouting. *Hypopitys Monotropa*, Crantz (yellow birds'-nest) grows locally in six divisions.

PLUMBAGINEÆ.—Var. *pyramidalis*, Syme of *Statice Limonium*, L. (sea lavender), which is common, occurs at Northfleet, Cuxton and near Sheerness; *S. rariflora*, Drejer being apparently confined to district 3. *S. auriculæfolia*, Vahl, fairly plentiful on the south coast, also grows at Ramsgate, Margate, in Harty Isle and about Sheerness.

PRIMULACEÆ.—*Hottonia palustris*, L. (water violet) is frequent. *Anagallis arvensis*, L., var. *carnea* (Schränk) has been seen at Higham, Shepherd's Well, Aylesford and Hawkhurst. *A. cærulea*, Schreb. (blue

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pimpernel), though generally distributed, is scarce outside district 2 ; but *A. tenella*, L. (bog pimpernel) is fairly common. *Centunculus minimus*, L. (bastard pimpernel) has been noted as follows : Chislehurst, Tunbridge Wells, Hothfield, Brabourne, Willesborough and near Sandling Park. *Samolus Valerandi*, L. (brookweed), a frequent coast plant, grows inland at Tunbridge Wells, Snodland, Kingsnorth and Ashford.

APOCYNACEÆ.—*Vinca minor*, L., though often only planted, is certainly native in many of its stations, and plentiful in districts 8, 9 ; it has been found in all the districts.

GENTIANEÆ.—*Erythræa pulchella*, Fr. (dwarf centaury) is scarce, but only absent from district 6 ; *E. capitata*, Willd. should be searched for in Thanet and on the south coast cliffs. *Gentiana Pneumonanthe*, L. (marsh gentian) has but two known stations, at Tunbridge Wells and Goudhurst ; and we distrust those which have been alleged for *G. campestris*, L. (*G. baltica*, Murb. is more likely to have been found). *Menyanthes trifoliata*, L. (bogbean) seems to be extinct in district 1, but grows freely in the marshes of district 5 and in a fair number of other east Kent localities. *Limnanthemum peltatum*, S. P. Gmel. (fringed water-lily) is said to occur within the county near Tunbridge Wells ; whether planted or native we have no means of judging.

BORAGINEÆ.—*Cynoglossum germanicum*, Jacq. (*C. montanum*, Lam.), is now lost at Eltham, Keston, Bromley, Northfleet and Sandwich (some of these cases, like that of Tunbridge Wells, may have been errors). G. E. Smith's station near Stouting may still produce it. *Anchusa sempervirens*, L. is a very scarce alien ; while *Pulmonaria officinalis*, L., said by Milne and Gordon (1793) to be abundant in woods between Chevening and Knockholt, and to occur between Cudham and Down, has not been verified since. *Myosotis repens*, L. is not uncommon in district 9, and perhaps elsewhere ; but most observers have failed to distinguish it from the common forget-me-not. *M. sylvatica*, Hoffm., although locally plentiful on chalk, cannot, upon the whole, be called frequent. *Lithospermum purpureo-cæruleum*, L. (blue gromwell), only found in and near Darenth Wood, appears at uncertain intervals, and has lately been sought for without success.

CONVOLVULACEÆ.—*Volulus Soldanella*, Junger (*Convolvulus*, L., sea bindweed) is recorded from Shellness, Westgate (perhaps extinct in these places), Pegwell to Deal, Dover to Folkestone and New Romney. *Cuscuta europæa*, L. (greater dodder) has a station or two noted in every district except 10 ; *C. Epithymum*, Murr. (lesser dodder), frequent on heather and furze, abounds on *Teucrium* at Dungeness ; and *C. Trifolii*, Bab. is a troublesome pest in clover fields.

SOLANACEÆ.—*Solanum nigrum*, L., var. *miniatum* (Bernh.) grew plentifully on the beach between Whitstable and Seasalter in 1875, but we failed to find it there in 1894 ; var. *luteo-virescens* (Gmel.) has occurred at Faversham and Tonbridge. *Atropa Belladonna*, L. (deadly nightshade) abounds on the bushy hills of districts 2, 6, being found more or less freely in all the districts, but probably not native off the

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chalk ; a remark likewise applying to the generally distributed *Hyoscyamus niger*, L. (henbane).

SCROPHULARIACEÆ.—*Verbascum Lychnitis*, L. var. *album*, Miller (white mullein) is quite common in district 2, and was formerly so in district 1 ; there are a few stations in districts 3, 6, 8, 9. *V. nigrum*, L. (dark mullein) seems to be equally at home on chalk and sand, avoiding clay. *V. virgatum*, Stokes used to grow at Erith ; it has been collected within living memory at Charlton, Forest Hill, Dartford, and between Walmer and Kingsdown, but is a doubtful native ; like *V. Blattaria*, L., which has occurred in eight districts, though scarce and decreasing. *Linaria repens*, Miller, reported from six places, was probably indigenous in most of them. *L. vulgaris*, L. (toadflax), var. *latifolia*, Bab. is only known from Northfleet chalk pit ; the monstrosity called var. *Peloria* has occurred near Dover and Faversham. *Mimulus Langsdorffii*, Donn (*M. luteus*, auct. angl., non L.) establishes itself here and there by streams and ditches. Of the critical eyebrights but little is yet known ; *Euphrasia Rostkoviana*, Hayne and *E. gracilis*, Fr. will no doubt be found on most of the heaths, and *E. nemorosa*, Pers. should prove to be common. *E. Kernerii*, Wettst. grows on the downs at Upper Halling ; we have also received specimens of *E. occidentalis*, Wettst., gathered last year at Walmer by Mr. C. P. Hurst. *Melampyrum arvense*, L. once occurred casually at Dover. *M. pratense*, L., var. *latifolium*, Bab. is well marked in chalk woods near Dartford, Shoreham, Adisham, Boxley, Hartlip and Wye ; but intermediates between it and the type may usually be met with.

OROBANCHACEÆ.—*Orobanche major*, L. (common broomrape) has occurred, but sparingly, in every district except 4, 10. *O. caryophyllacea*, Sm., confined to the south-east coast, is locally plentiful from Sandwich to Folkestone ; one of its best stations is destroyed by the recent boring for coal near Dover. *O. elatior*, Sutton has been rarely observed, viz. about Woolwich, Trottescliffe, Bigberry Woods (district 3), Dover and Tunbridge Wells. *O. Picridis*, F. Schultz only grows on the undercliff between St. Margaret's and Kingsdown, and at Deal ; *O. Hederæ*, Duby (ivy broomrape) near Shoreham, and in an unspecified locality in district 10 (Wollaston). *O. minor*, Sm. (lesser broomrape), seldom native, is a noxious weed in clover fields throughout the county. *O. amethystea*, Thuill., limited to the undercliff near St. Margaret's, and at Abbot's Cliff and Lydden Spout near Dover, is parasitical on wild carrot and occasionally on restharrow. *Latbræa Squamaria*, L. (toothwort), though locally abundant, has not been observed in districts 3 to 5.

LENTIBULARIACEÆ.—*Utricularia vulgaris*, L. (common bladderwort), plentiful in the marshes of district 5, has been found in six other divisions ; but *U. neglecta*, Lehm. has only been detected near Faversham, at Ham Ponds and at Headcorn ; *U. minor*, L. at Ham Ponds, and Eldergate in Romney Marsh.

LABIATÆ.—*Mentha rotundifolia*, L. (round-leaved mint) has a dozen

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stations in districts 1 to 8 ; *M. longifolia*, Huds. (*sylvestris*, L., horse mint) occurs in all the divisions, sometimes freely ; and *M. sativa*, L. (a series of hybrids between *arvensis* and *hirsuta*) is not uncommon. *M. piperita*, L. (peppermint) has been found about Deal, Luton, Headcorn, Boxley and Rolvenden ; *M. rubra*, Sm. at Keston, Faversham (casual) and Sturry ; *M. gentilis*, L. only by the Medway below Tonbridge. The recorded stations of *M. Pulegium*, L. (pennyroyal) are Chislehurst Common, Lewisham, Bickley, Dartford, Ospringe (near Faversham) and Dover. *Origanum vulgare*, L. (marjoram), var. *megastachyum* (Link) is a speciality of the undercliff near Folkestone. *Thymus Chamaedrys*, Fr., as yet comparatively little known, is probably general on dry soils. *Calamintha parviflora*, Lam. (*C. Nepeta*, Clairv.) occurs in districts 1 to 8 ; and is sometimes abundant, though far less general than *C. officinalis*, Mœnch (common calamint) ; *C. sylvatica*, Bromf. has also been reported from near Wye, but we have seen no Kentish specimen. *Melissa officinalis*, L. (balm) may be found naturalized here and there. *Salvia pratensis*, L. (meadow clary) is native about Cobham and Cuxton, near Hartlip, and between West Malling and Wrotham ; casual or sporadic at Whitstable and Ryarsh, and extinct at Mersham Hatch. *Nepeta Cataria*, L. (cat mint), recorded from every district except 10, is rather common on the chalk ; *Scutellaria minor*, Huds. (lesser skullcap) being scarce outside districts 8, 9. *Melittis Melissophyllum*, L. (bastard balm) may perhaps be truly wild in its solitary station between Penshurst and Maidstone. *Marrubium vulgare*, L. (horehound), though not very rare, is usually an evident escape ; while *Stachys germanica*, L., formerly found near Darenth and Lyminge, has not been obtained lately. *S. annua*, L. used to occur in fields near Gadshill and Strood ; it has also been met with abundantly on the open downs near Trottescliffe, as well as near Sevenoaks, and may quite possibly be a native. *Galeopsis dubia*, Leers (*villosa*, Huds.) was formerly found in the neighbourhood of Dartford ; *G. speciosa*, Miller (*versicolor*, Curt.) has been observed only on eight occasions. *Leonurus Cardiacæ*, L. (motherwort) has occurred, doubtless a mere escape, at Woodchurch, Ospringe and Saltwood. *Lamium hybridum*, L. is locally plentiful in sandy ground. *Teucrium Botrys*, L. has a single station on the downs above Upper Halling ; whereas *Ajuga Chamæpitys*, Schreb. is frequent on chalk, particularly in district 2.

PLANTAGINÆ.—*Littorella juncea*, Berg. (shore weed) is remarkably rare, being only found at Brabourne and Dungeness.

CHENOPODIACEÆ.—*Chenopodium polyspermum*, L., abundant in district 1, is frequent off the chalk ; while *C. Vulvaria*, L., though local, mainly haunts the tidal rivers and coast, like *C. ficifolium*, Sm. and *C. murale*, L. *C. hybridum*, L. and *C. urbicum*, L. are rather rare. *C. botryodes*, Sm. only grows in the Thames salt marshes and near Sandwich ; and *C. glaucum*, L. in two or three spots near London. *Atriplex laciniata*, L. is restricted to the shores of districts 3, 4, 5, 10 ; *A. pedunculata*, L. to the neighbourhood of Gravesend, Herne Bay and Sandwich. Of the glassworts, *Salicornia stricta*, Dum. is common ; *S. procumbens*, Sm. and

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S. ramosissima, Woods apparently not unfrequent. *S. appressa*, Dum. grows at Seasalter and New Romney; *S. radicans*, Sm. being plentiful in the marshes of district 3 and near Sandwich, besides occurring on the Isle of Grain and at Deal and Romney.

POLYGONACEÆ.—*Polygonum dumetorum*, L. has only been noticed about Woolwich, Faversham, Trinley and Ashford; *P. Raii*, Bab. on Grain Spit, and at Whitstable, Sandwich and Sandgate. *P. minus*, Huds., figured in *English Botany* from Blackheath, has also been found at Seal Chart, and possibly near Tunbridge Wells on the Kent side. *P. mite*, Schrank, a species easily overlooked, is recorded from Lewisham, Chislehurst, Minster (Sheppey), Hadlow and Tunbridge Wells; *P. maculatum*, Trim. & Dyer, being widely, though somewhat thinly, spread. Outside district 8 *P. Bistorta*, L. (snakeweed) must be described as a rarity. *Rumex maritimus*, L. (golden dock) has only been gathered in the Thames marshes, and about Hythe and Romney; its near ally, *R. limosus*, Thuill. (*palustris*, Sm.) from Charlton to Erith, at Whitstable, and perhaps between Margate and Sandwich.

THYMELÆACEÆ.—*Daphne Mezereum*, L. (mezereum) is extremely scarce, the only known stations being at Cobham, Godmersham and near Broome Park; thus offering a great contrast with the abundance of the spurge laurel (*D. Laureola*, L.).

ELÆAGNACEÆ.—*Hippophaë rhamnoides*, L. (sea buckthorn), though extinct in Sheppey, abounds at intervals round the coast from Deal to Romney.

LORANTHACEÆ.—*Viscum album*, L. (mistletoe) is uncommon, but grows in every division except district 10.

SANTALACEÆ.—*Thesium humifusum*, DC., long sought for in vain, has recently been discovered by the Rev. E. Ellman near Bishopsbourne.

EUPHORBACEÆ.—*Euphorbia platyphyllos*, L. (warted spurge), though unknown only for districts 5, 6, is rare, especially northwards. *E. Cyparissias*, L. (cypress spurge) may be a true native on chalky hill-sides near Dover; while *E. Paralias*, L. (sea spurge) has become extremely scarce owing to the inroads of the sea. *E. Lathyris*, L. (caper spurge), usually an obvious escape, has some claim to be thought indigenous near Cobham, Boxley and Milton; as has *Buxus sempervirens*, L. (box) at Boxley.

URTICACEÆ.—Our two species of elm are both questionable natives, unlike the hop (*Humulus Lupulus*, L.), though that is so extensively cultivated. The Roman nettle (*Urtica pilulifera*, L.) has quite disappeared from Romney and Lydd.

MYRICACEÆ.—*Myrica Gale*, L. (bog myrtle), not found recently at Tunbridge Wells or Willesborough, may yet be discovered in two or three other neighbourhoods.

SALICINEÆ.—*Salix aurita*, L., *S. Caprea*, L., *S. cinerea*, L. and *S. repens*, L. are certainly, *S. fragilis*, L. and *S. purpurea*, L. probably native; the other species are usually, if not always planted. Several hybrids occur *Smithiana* forms being common. *Populus alba*, L. and

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P. canescens, Sm. generally look like aliens ; but *P. tremula*, L. (aspen) is truly wild, and abounds in the Wealden woods.

CERATOPHYLLÆ.—Both species of hornwort (*Ceratophyllum demersum*, L. and *C. submersum*, L.) are rather common ; but the latter does not grow at any great distance from tidal waters.

HYDROCHARIDÆ.—*Elodea canadensis*, Michaux (American weed) has become as plentiful in Kent as in the neighbouring counties. *Stratiotes aloides*, L. grows in a pond near Dymchurch, where it was almost certainly introduced.

ORCHIDACEÆ.—No British county excels Kent in the number of its orchids, though these are sadly diminished since a century ago, largely owing to the rapacity of collectors. *Malaxis paludosa*, Sw. (bog orchis) has only been found for certain near Tunbridge Wells and Cranbrook. *Neottia Nidus-avis*, Rich. (birds'-nest orchis) abounds in chalky woods. *Cephalanthera ensifolia*, Rich. has been obtained near Cobham, Cuxton, Falkham and Tunbridge Wells ; while *C. pallens*, Rich. (*grandiflora*, Bab.) is an ornament of most beech-groves. *Epipactis violacea*, Bor. has been recorded from Ryarsh, Cobham, Cuxton, Waldershare, Ospringe, Dunton Green and Cowden ; but it is sometimes confused with the much more frequent *E. media*, Bab., a species perhaps too closely allied with the common *E. latifolia*, All. (broad-leaved helleborine). *E. palustris*, Crantz (marsh helleborine), known for about fifteen localities, is abundant in some of them. *Orchis hircina*, Scop. (lizard orchis), once locally frequent in district 2, has disappeared from nearly all the old stations ; but a fine specimen is still known near Wye, and a trustworthy informant tells us that thirty plants were found at one spot in 1900. *O. ustulata*, L. (dwarf orchis), perhaps extinct in district 2, still occurs in districts 5, 6, 7, 10 ; *O. purpurea*, Huds. being locally plentiful in districts 2, 5, 6, 7. *O. pyramidalis*, L., *O. Morio*, L., *O. mascula*, L., *O. latifolia*, L. and *O. maculata*, L. are all more or less abundant ; whereas *O. incarnata*, L. has been discovered only in Minster Marshes (Thanet), and at Ham Ponds and Lamberhurst. *Aceras anthropophora*, R. Br. abounds in many places on the chalk ; as do *Ophrys apifera*, Huds. (bee orchis), *O. muscifera*, Huds. (fly orchis), and the more local *O. aranifera*, Huds. (spider orchis). *O. arachnites*, Lam. is now practically restricted to the south-east in districts 7, 10 ; but *Hermidium Monorchis*, R. Br. (musk orchis) has a wide range, and is fairly common in districts 2, 7. *Habenaria conopsea*, Benth. (fragrant orchis), *H. bifolia*, R. Br. and *H. chloroleuca*, Ridley (butterfly orchis) occur freely ; while the frog orchis (*H. viridis*, R. Br.) is decidedly scarce, and *H. albida*, Br. has only been observed at Lyminge.

IRIDÆ.—The stinking iris (*Iris fœtidissima*, L.) is pretty common in several districts. *I. Pseudacorus*, L. (yellow flag) usually occurs as the var. *acoriformis* (Bor.). The pale-flowered var. *Bastardi* (Bor.) appears to have been once found at Hayes.

AMARYLLIDÆ.—*Narcissus biflorus*, Curt. and *N. pæticus*, L. are not true natives, though the former is well established occasionally ; the

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daffodil (*N. Pseudo-narcissus*, L.) is however frequent, and often grows in great plenty, particularly on clay. Only eight stations are known for *Galanthus nivalis*, L. (snowdrop), which is usually, if not always, planted. The snowflake (*Leucojum æstivum*, L.) has perhaps been recently destroyed in Plumstead Marshes, where it was certainly found up to 1888; it is extinct at Greenwich, but probably survives by the Medway at Cuxton.

LILIACEÆ.—*Asparagus officinalis*, L. formerly grew by the Thames at Greenwich and Gravesend, and still exists near Romney. *Polygonatum multiflorum*, All. (Solomon's seal) is rare, though found in eight divisions; the only ascertained habitat of *P. officinale*, All. being Joyden's Wood, Bexley. *Convallaria majalis*, L. (lily of the valley) is local, rather than rare. *Allium vineale*, L. (crow garlic) and *A. ursinum*, L. (ramsons) are generally distributed; *A. oleraceum*, L. chiefly grows in east Kent, and is nowhere common. *Scilla autumnalis*, L. lingers on Blackheath, and probably still occurs at Shorne Warren. *Fritillaria Meleagris*, L. (snake's-head) used to be found at Bromley, Higham and Upnor, and may yet exist in the two last-named stations. *Gagea fascicularis*, Salisb. has been reported from West Coombe Park and Dartford; *Colchicum autumnale*, L. (meadow saffron) from Littlebourne and Cranbrook, as well as (formerly) from near Plumstead. *Narthecium ossifragum*, Huds. (bog asphodel) is quite scarce; its only stations being at Bromley, Keston, Hothfield, Willesborough and near Tunbridge Wells. Herb Paris (*Paris quadrifolia*, L.), found in every district, abounds in many chalk copses.

JUNCACEÆ.—The scarceness of *Juncus squarrosus*, L. is strange, considering the number of heaths in the county; we only know of about half a dozen distinct stations, though it is frequent near Tunbridge Wells. Some of those assigned to *J. compressus*, Jacq. doubtless belong to *J. Gerardi*, Loisel. *J. maritimus*, Lam. is plentiful, ascending the Thames up to Erith; but *J. acutus*, L. only extends along the sandy stretch between Deal and Pegwell Bay. *J. obtusiflorus*, Ehrh. is local and mainly submarine. *Luzula Forsteri*, DC. abounds in many parts, often forming hybrids with *L. vernalis*, DC. ('*L. Borreri*, Bromf. '); and *L. maxima*, DC. (great woodrush), though absent over large areas, is not uncommon; this also holds good of *L. erecta*, Desv. (*multiflora*, Lej.).

TYPHACEÆ.—Both species of bulrush are locally plentiful, *T. angustifolia*, L. probably more so than in any other English county. *Sparganium neglectum*, Beeby, a recent segregate, will surely prove to be frequent when better known; and *S. simplex*, Huds. grows in every district but 10. Excepting a Tunbridge Wells specimen in Dillenius' herbarium, the peat-loving *S. minimum*, Fr. appears to be limited to the brooks, Margate, and the marshes about Deal and Sandwich.

AROIDEÆ.—*Arum italicum*, Mill. flourishes near the south coast at Folkestone, Sandgate, Shornecliffe and Postling. *Acorus Calamus*, L. (sweet flag) has been found in Sturry Marshes (district 5), at Penshurst, and by a pond in private grounds at Bexley.

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LEMNACEÆ.—*Lemna gibba*, L. and *L. polyrbiza*, L. (great duckweed) are both local, but occur in all the districts. *Wolffia Michelii*, Schleid. has been found in several parts of districts 4, 5, and also near Lydd.

ALISMACEÆ.—*Alisma ranunculoides*, L., absent only from districts 3, 6, 9, is yet rare, except near Canterbury, Sandwich and Deal. The arrowhead (*Sagittaria sagittifolia*, L.) abounds in the Weald and in Thanet, though elsewhere uncommon; *Butomus umbellatus*, L. (flowering rush) is frequent; but *Damasonium stellatum*, Pers. (*Actinocarpus Damasonium*, R. Br.), always very scarce, has not, we believe, been met with lately.

NAIADACEÆ.—*Potamogeton polygonifolius*, Pourr. is local rather than rare. *P. lucens*, L., *P. pusillus*, L., *P. pectinatus*, L., and *P. interruptus*, Kit. (*flabellatus*, Bab.) are all frequent; the last-named abounds in brackish water. Of the scarcer species we may mention *P. coloratus*, Hornem. (*plantagineus*, Du Croz), found at Ham Ponds, Preston and Hothfield; *P. alpinus*, Balb. (*rufescens*, Schrad.), about Tonbridge, Marden, Staplehurst and Sholden; *P. angustifolius*, Presl (*Zizii*, Roth), in the Stour near Wye; *P. acutifolius*, Link, at Withamdraw (district 5) and Appledore; *P. obtusifolius*, Mert. & Koch, rare in seven districts; and *P. Friesii*, Rupr., at Dartford, Marden and several places in Thanet. *Ruppia spiralis*, Hartm. occurs in six localities (districts 2, 3, 10); *R. rostellata*, Koch being fairly common in saline pools and ditches, often accompanied by *Zannicbellia pedicellata*, Fr. *Zostera marina*, L. (grass-wrack) is apparently absent from the south coast, being confined to districts 3, 4.

CYPERACEÆ.—*Cyperus longus*, L. (galingale) has but a single station near Seabrooke (district 10). *Eleocharis uniglumis*, Reichb., only found on the coast, has been noticed at Deal, Ham Ponds and Dungeness; *E. multicaulis*, Sm. at Keston, Greenhithe, Faversham, Hothfield and Tunbridge Wells. *Scirpus pauciflorus*, Lightf. occurs at Ham Ponds and Dungeness; *S. cæspitosus*, L., *S. fluitans*, L., and *S. setaceus*, L. being all rather uncommon. *S. carinatus*, Sm., now lost at Greenwich, grows plentifully with *S. triqueter*, L. by the Medway at Aylesford. *S. sylvaticus*, L. has its headquarters in the Weald; and *S. Caricis*, Retz (*Blysmus compressus*, Panz) is scarce in six districts. *Eriophorum vaginatum*, L. (hare's-tail cotton grass) seems to be lost from Tunbridge Wells; its alleged stations in Thanet rest on questionable authority. *E. angustifolium*, Roth (common cotton-grass) is thinly distributed; and *E. latifolium*, Hoppe has but two stations at Herringe and Willesborough. *Rhynchospora alba*, Vahl has only been found near Tunbridge Wells; *Schænus nigricans*, L. near Folkestone, and perhaps in Thanet. *Cladium jamaicense*, Crantz occurs in district 5 at Ham Ponds, Hacklinge, Sholden and near Deal. The sedges have not yet been thoroughly worked out in Kent. Among the more frequent species are *Carex divisa*, L. (sub-maritime), *C. disticha*, Huds., *C. arenaria*, L. (inland on Wrotham Heath), *C. paniculata*, L., *C. vulpina*, L., *C. muricata*, L., *C. divulsa*, Good., *C. remota*, L., *C. ovalis*, Good., *C. acuta*, L. (mainly in district 8), *C. Goodenowii*, J. Gay (*vulgaris*, Fr.), *C. flacca*, Schreb. (*glauca*, Scop),

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C. pilulifera, L. (dry heaths, etc.), *C. verna*, Chaix. (*præcox*, Jacq.), *C. pallescens*, L., *C. panicea*, L., *C. pendula*, Huds. (common in the Weald), *C. sylvatica*, L., *C. binervis*, Sm. (on heaths), *C. distans*, L. (submaritime), *C. flava*, L. (as an aggregate), *C. birta*, L., *C. Pseudo-cyperus*, L., *C. acutiformis*, Ehrh. (*paludosa*, Good.), *C. riparia*, Curt., *C. rostrata*, Stokes, and *C. vesicaria*, L. (in the Weald). *C. pulicaris*, L. is inconspicuous and scantily recorded; *C. teretiuscula*, Good. has been found at Upnor near Faversham and at Ham Ponds, Brooke and Dungeness; *C. echinata*, Murr. (*stellulata*, Good.) being local in six districts. *C. axillaris*, Good. (*remota* × *vulpina*) is of occasional, *C. Bænningshausiana*, Weihe (*paniculata* × *remota*) of very rare occurrence (Tunbridge Wells); *C. elongata*, L. only grows near Tonbridge. *C. curta*, Good., preferring peat overlying sand, finds but few places to suit it; and *C. Hudsonii*, Ar. Benn. (*stricta*, Good.) is limited to the Deal and Sandwich neighbourhood, though there abundant. *C. montana*, L. grows near Faversham and in the woodlands north of Canterbury; *C. strigosa*, Huds. at Charlton, Tunbridge Wells, Cranbrook, Benenden and Sutton Valence; *C. lævigata*, Sm. in the south (districts 8, 9, 10). *C. Hornschuchiana*, Hoppe is recorded by G. E. Smith from Sandgate and Smeeth. *C. extensa*, Good. is found only near Sandwich and Reculver. *C. Oederi*, Retz has occurred at Keston, Shooters Hill, Sandwich and Willesborough.

GRAMINEÆ.—*Spartina stricta*, Roth grows rather freely in district 3, to which it is apparently confined. *Alopecurus fulvus*, Sm. (a plant of strong soils, easily overlooked) has been gathered about Eltham, Hayes, Faversham, Sutton Valence, Marden and Staplehurst; *A. bulbosus*, Gouan only in north Kent, near Erith, Northfleet, Cooling and in Sheppey. *Milium effusum*, L. (millet grass), though local, flourishes in every district. *Pbleum arenarium*, L. occurs near Whitstable, from Pegwell Bay to Deal, and from Sandgate to Romney. *Polypogon monspeliensis*, Desf., now lost near the Thames, except in Plumstead Marshes, is also found at Halstow, Whitstable and Sandwich Flats. *P. littoralis*, Sm. (*Agrostis palustris* × *P. monspeliensis*) used to grow at Plumstead. *Calamagrostis epigeios*, Roth, though scarce, is much less so than *C. lanceolata*, Roth, reported on good authority from Sellinge, but very doubtfully from Walmer and Charlton. *Gastridium australe*, Beauv. (nit grass), more plentiful in the Weald than elsewhere, seems to be sometimes native both on the coast and inland; but *Apera Spica-venti*, Beauv. is a rather rare colonist. *Sieglingia decumbens*, Bernh. (*Triodia decumbens*, Beauv.) is less frequent than in most southern counties; on the other hand, *Molinia varia*, Schrank (*cærulea*, Mænnch) is pretty generally distributed off the chalk. *Poa bulbosa*, L. abounds between Deal and Pegwell Bay; it has also lately been discovered on the greensand cliffs at Folkestone. *P. compressa*, L., though rather uncommon, has been noted in eight districts. *Glyceria plicata*, Fr. is fairly plentiful; the subspecies (or variety) *G. declinata*, Bréb., hitherto recorded only from Eltham and Hothfield, may prove to be not unfrequent where water has stood in winter. *G. distans*, Wahl., var. *pseudo-procumbens*, Wolley-Dod, which its author discovered

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in marshes at Plumstead and Higham, was suspected by him to be *Festuca procumbens* × *G. distans*; being almost intermediate and always accompanied by both species. *G. Borreri*, Bab. is locally abundant in muddy salt marshes of the north and east, its one station on the south coast being at Dymchurch. *Festuca uniglumis*, Soland. grows sparingly on Deal sandhills; together with plenty of *F. ambigua*, Le Gall, also found about Sandwich and Littlestone. *F. sylvatica*, Vill. is a Tunbridge Wells rarity. *F. loliacea*, Curt. (*F. pratensis* × *Lolium perenne*) has occasionally been met with. *Bromus madritensis*, L., was once found upon the beach at Walmer and at Deal; several allied species are casuals near Woolwich. *B. interruptus*, Druce, hitherto detected only at Eltham, Dartford and Barham, may easily have been passed by as a form of *B. mollis*, L. *Lolium temulentum*, L. (darnel) is uncommon. Our maritime forms of *Agropyron* (*Triticum*) are well represented in the county. *Hordeum sylvaticum*, Huds. is reported from Riverhill (district 8), Hawkhurst and Cranbrook (district 9); the two last seem unlikely places for it. *Elymus arenarius*, L. (lyme grass) really grows at Dover, as alleged; this makes the Thanet stations given by Flower less improbable than we had supposed.

FILICES.—In the suburban districts it is now difficult to find any fern except bracken, and the rarer species have been sadly thinned out elsewhere. *Hymenophyllum tunbridgense*, Sm. (filmy fern), *Asplenium lanceolatum*, Huds., and *Cystopteris fragilis*, Bernh. are nearly, if not quite, destroyed at Tunbridge Wells; *Osmunda regalis*, L. only exists in a few remote spots, and *Ceterach officinarum*, Willd. is in much the same plight. *Lastræa Thelypteris*, Presl, *L. Oreopteris*, Presl, and *L. spinulosa*, Presl, still however occur in fair quantity. *L. æmula*, Brackenbridge has two stations assigned to it in district 8. *Botrychium Lunaria*, Sw. (moonwort) was lately found near Goudhurst, and may survive in some of its old haunts; *Ophioglossum vulgatum*, L. (adder's tongue) is frequent, except in the north-west.

EQUISETACEÆ.—*Equisetum sylvaticum*, L. (wood horsetail), though observed in six of our divisions, must be called scarce. There are specimens of *E. hyemale*, L. from east Kent in herbaria, but we do not know the precise locality. Several other species occur freely.

LYCOPODIACEÆ.—*Lycopodium inundatum*, L. (bog clubmoss) still grows at Keston and Hothfield, though probably lost at Chislehurst. *L. clavatum*, L. (stag's-horn moss) has three stations in district 8 and four in district 9.

MARSILEACEÆ.—*Pilularia globulifera*, L. (pillwort) is only recorded from Sutton Valence.

THE MOSSES (*Musci*).

The chief feature of the Bryological flora of Kent is the absence of the great majority of subalpine mosses, and of such as would occur in boggy districts or on elevated moors, these geographical features being almost absent from Kent. This is the more singular in that the sand rocks, just over the border of the county, in Sussex, furnish many subalpine species, especially south of Tunbridge Wells. On the other hand the mosses characteristic of the

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chalk formation are as well represented as they are in the South Downs of Sussex. A list of the species found in Kent was published by the writer of this article in the *Journal of Botany*, 1888, and a number of species that had not then been discovered were pointed out as likely to occur. Most of these were subsequently detected in the county and an additional list was published in the same *Journal* in 1901, pp. 179, 227.

But in the meanwhile the nomenclature of mosses had been altered, and it is consequently necessary to give the list anew in order to bring it up to date, more especially as several more species have been detected since 1901. This increase of species has been largely due to the investigations of the Rt. Hon. Mr. Justice Stirling of Goudhurst, Mr. W. E. Nicholson of Lewes, and Mr. E. S. Salmon of Reigate, who have explored the district around Goudhurst, to Mr. L. J. Cocks of Bromley, and to Mr. A. W. Hudson of Cranbrook, and in the case of *Sphagna* to Mr. E. C. Horrell of Chelmsford.

The classification and nomenclature that have been followed in this list are those of the second edition of the *Student's Handbook of British Mosses*, by H. N. Dixon, M.A., and H. G. Jameson, M.A., published in 1904. The species rare in the county are indicated by an asterisk. Those which as yet have been found only in Kent are *Catharinea tenella* in fruit and *Ephemerum stellatum*. A few species are extremely rare in other counties, e.g. *Nanomitrium tenerum* and *Pottia caespitosa*, *Weissia sterilis*, *W. crispata* and *W. multicaulis*. The list includes 283 species, exclusive of numerous varieties.

SPHAGNACEÆ		POLYTRICHACEÆ		Dicranella *crispa, Schimp. 8	
Sphagnum	acutifolium, Ehrh.	Catharinea	*angustata, Brid.	(Speldhurst)	
1, 9		9 (Goudhurst)	(fruiting)	— heteromalla, Br. & Schimp.	
var. rubellum, Russow.	1	— *tenella, Röhl.	9 (Goudhurst), fruiting.	1, 6, 8, 9	
— var. viride, Warnst.	1	— rare.		— *rufescens, Schimp.	9 (Goudhurst)
— crassicaudum, Warnst.	8	— undulata, Web. & Mohr.	1-10	— *Schreberi, Schimp.	6 (Bredhurst), 7 (Dover), 8 (Seven-oaks)
— cuspidatum, R. & W.	1	var. attenuata, Wils.	9	var. *elata, Schimp.	9 (Goudhurst)
— var. falcatum, Russ.	1	var. minor, H. & M.	8	— varia, Schimp.	2, 8
— cymbifolium, Ehrh.	1, 9	Polytrichum	aloides, Brid.	Dicranoweissia	cirrhatta, Lindb.
var. congestum, Schimp.	9	— commune, L.	1, 2, 8, 9	8, 9	
var. versicolor, Warnst.	9	— formosum, Hedw.	1, 8, 9	Campylopus	flexuosus, Brid.
— var. pallescens, Warnst.	1	— juniperinum, Wils.	1, 8, 9	1, 8,	
— fimbriatum, Wils.	1	— nanum, Brid.	8	9	
— intermedium, Hoffm.	1, 8	— piliferum, Schreb.	8	— *fragilis, Br. & Schimp.	8 (Rusthall Common)
— medium, Limpr.		— strictum, Banks.	10	— pyriformis, Brid.	1, 8, 9
var. roseum, Warnst.	1	— urnigerum, Brid.	8, 9	Dicranum	Bonjeani, De Not.
— molluscum, Bruch.	1			9, 10	
— papillosum, Lindb.	1			var. rugifolium, Bosw.	9
var. sublaeve, Warnst.	1, 8			— *flagellare, Hedw.	1 (Bostall Wood, Abbey Wood)
var. normale, Warnst.	1			— majus, Turn.	1, 8
— rigidum, Schimp.	1			— *montanum, Hedw.	1 (Abbey Wood)
— rubellum, Wils.				— scoparium, Hedw.	1, 8
var. rubrum, Grav.	1			— *Scottianum, Turn.	8 (Chiddingstone)
— rufescens, Warnst.	1			Leucobryum	glaucum, Schimp.
— squarrosum, Pers.	1, 8, 9			8, 9	
— subsecundum, Nees.	1, 8,				
var. contortum, Schimp.	1, 9				
var. obesum, Wils.	9				
— subnitens, R. & W.					
var. violascens, Warnst.	9				
var. virescens, Warnst.	9				
— trinitense, C. Müll.	1				
— turfaceum, Warnst.	1				
TETRAPHIDACEÆ		DICRANACEÆ		FISSIDENTACEÆ	
Tetraphis	pellucida, Hedw.	Archidium	*alternifolium, Schimp.	Fissidens	adiantoides, Hedw.
1, 2 (fruiting, Joyden's		9 (Goudhurst)		9, 10	
Wood), 8 (near Ightham),		Pleuridium	alternifolium,	var. collinus, Dixon.	8, 10
9 (fruiting near Goud-		Rabenh.	8 (Ightham).	— bryoides, Hedw.	8
hurst)		— axillare, Lindb.	8, 9	— *decipiens, De Not.	8 (Seven-oaks, Godden Green)
— *Browniana, Grev.		— subulatum, Br. & Schimp.	8, 9	— *exilis, Hedw.	1 (Bromley, Keston)
8 (Tunbridge Wells), 9		Ditrichum	flexicaule, Hampe.	— incurvus, Stark.	1
(Goudhurst). Very rare.		2, 5 (Sibbertswold), 8		— pusillus, Wils.	8
		— homomallum, Hampe.	1, 9		
		Seligeria	calcareia, Br. & Schimp.		
		2, 8			
		— *paucifolia, Carr.	8 (Dunton Green; Maidstone), 10 (Folkestone)		
		— *pusilla, Br. & Schimp.	8 (Kemsing; Dunton Green)		
		Ceratodon	purpureus, Brid.		
		8, 9,			
		Cynodontium	*Bruntoni, Br. & Schimp.		
		8 (Tunbridge Wells)			
		Dichodontium	*pellucidum,		
		Schimp.	8, 9		
		Dicranella	cerviculata, Br. & Schimp.		
		8, 9			

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Fissidens taxifolius, Hedw. 8, 10
— *viridulus*, Wahl. 1, 8, 9
var. *fontanus*, Wils. 8

GRIMMIAEÆ

Grimmia apocarpa, Hedw. 8, 9, 10
var. *gracilis*, Wils. 8
— **commutata*, Hübn. On tiled roofs, 9 (*Goudhurst*)
— **decipiens*, Lindb. On tiled roofs, 9 (*Goudhurst*)
— **orbicularis*, Bruch. 8 (*Sevenoaks*)
— *pulvinata*, Smith. 1, 8, 9, 10
var. *obtusa*, Hübn. 8 (*Knole Park*)
— **trichophylla*, Grev. 8 (*Ightham, Tunbridge Wells*), 9 (*Goudhurst*)
Racomitrium **aciculare*, Brid. 9 (*Goudhurst*), 8 (*Rusthall Common*)
— **canescens*, Brid. 8 (*Rusthall Common*, in fruit; *Westerham*)
— **heterostichum*, Brid. 8 (*Ightham*, in fruit); 9 (*Goudhurst*, on roofs)
— **lanuginosum*, Brid. 9 (*Goudhurst*, on tiled roofs)

TORTULACEÆ

Acaulon muticum, C. Müll. 1, 2, 8
Phascum curvicolleum, Ehrh. 2, 8, 10,
— **Floerkeanum*, W. & M. 1 (*Keston*), 2 (*Shoreham*), 8 (*Otford*)
— *cuspidatum*, Schreb. 2, 3, 8
Pottia **bryoides*, Witt. 2 (*Shoreham*); 9 (*Goudhurst*)
— **cæspitosa*, C. M. 8 (*Shoreham, Kemsing*)
— *Heimii*, Turn. 5
— *intermedia*, Turn. 1, 8, 9
— *lanceolata*, C. M. 3, 8, 10
— *minutula*, Turn. 5, 8, 9
— *recta*, Mitt. 8, 9 (*Goudhurst*)
— **Starkeana*, C. M. 8 (*Pembury*), 2 (*Greenhithe*)
— *truncatula*, Lindb. 1, 5, 8
Tortula aloides, De Not. 2, 8, 10
— *ambigua*, Br. & Schimp. 2, 8
— **atrovirens*, Lindb. 10 (*Folkestone*)
— **cuneifolia*, Roth. 7 (*Dover*), 8 (*Rusthall Common*)
— *intermedia*, Berk. 8, 9
— *lævipila*, Schwaegr. 6, 7, 8, 10
— *marginata*, Spruce. 2, 8
— *muralis*, Hedw. 8, 9, 10
var. *rupestris*, Sch. 8
var. *æstiva*, Brid. 8, 9

Tortula **mutica*, Lindb. 1 (*Chislehurst*), 8 (*Otford*), 9 (*Goudhurst*)
— **papillosa*, Wils. 8 (*Sevenoaks*), 9 (*Postling, Hothfield*), 10 (*Lympne*)
— **pusilla*, Mitt. 2 (*Greenhithe*), 8 (*Keston, Wrotham, Otford*)
— **rigida*, Schultz. 8 (*Maidstone*)
— *ruralis*, Ehrh. 8
— *ruraliformis*, Dixon. 5
— *subulata*, Hedw. 8
Barbula convoluta, Hedw. 1, 3, 8, 10
— *cylindrica*, Schimp. 2 (*Greenhithe*, in fruit), 8
— *fallax*, Hedw. 1, 8
var. *brevifolia*, Wils. 6, 8
— **Hornschuchiana*, Schultz. 1 (*Shoreham*), 8 (*Borough Green, Bessell's Green*)
— *lurida*, Lindb. 2, 8 (*Godden Green*, in fruit), 10
— *revoluta*, Brid. 8, 9
— *rigidula*, Mitt. 7, 8, 9
— *rubella*, Mitt. 8, 9
— *sinuosa*, Braithw. 8, 10
— **spadicea*, Mitt. 9 (*Goudhurst*)
— *tophacea*, Mitt. 8, 10 (*Romney Marsh*)
— *unguiculata*, Hedw. 1-10
var. *apiculata*, Wils. 8
— *vinealis*, Brid. 1, 8 (*Ightham*, in fruit)
Leptodontium **flexifolium*, Hampe. 2 (*Halstead*), 9 (*Goudhurst*)
— **gemmascens*, Braithw. 8 (*Riverhead*)
Weisia crispata, Mitt. 1 (*Keston*), 3, 7, 8
var. *intermedia*, W. E. Nich. 2 (*Shoreham*)
— **crispata*, C. M. 2 (*Shoreham*)
— *microstoma*, C. M. 2, 8
var. *obliqua*, C. M. 8
— **multicapsularis*, Mitt. 8 (*Ightham, Bessell's Green*)
— **mucronata*, Br. & Schimp. 1 (*Forest Hill*), 3 (*Sheerness, Whitstable*)
— **squarrosa*, C. M. 8 (*Stone Street, Bessell's Green, Otford*), 9 (*Goudhurst*)
— **sterilis*, W. E. Nicholson. 8 (*Boxley Hill, Fawke Common*)
— **tenuis*, C. M. 8 (*Maidstone, Sevenoaks, Leaves Green*)
— **tortilis*, C. M. 8 (*Kemsing, Wrotham*), 10 (*Sandgate*),

Weisia **verticillata*, Brid. 8 (*Ightham, Maidstone*), 10 (*Beachborough*)
— *viridula*, Hedw. 2, 7, 8, 9
Trichostomum **crispulum*, Bruch. 7 (*Folkestone Warren*)
— *flavovirens*, Bruch. 5, 7, 10
— **mutabile*, Bruch. 5 (*Sibertswood*)
— **tortuosum*, Dixon. 2 (*Swanley*)
Pleurochaete **squarrosa*, Lindb. 5 (*Deal, Sandwich*), 10 (*New Romney*)
Cinclidotus **Brebissonii*, Husn. 8 (*Penshurst and Goudhurst* in fruit; *Tonbridge*)

ENCALYPTACEÆ

Encalypta streptocarpa, Hedw. 6, 8, 9
— *vulgaris*, 1, 2, 8 (*Cobham*)

ORTHOTRICHACEÆ

Zygodon viridissimus, Brid. 1, 2, 7, 8, 9
var. *rupestris*, Hartm. 8 (near *Sevenoaks*, in fruit)
Uloa Bruchii, Hornsch. 3, 8, 9, 10
— *crispa*, Brid. 6, 8
— *phyllantha*, Brid. 5, 9
Orthotrichum affine, Schrad. 3, 8, 10
— *anomalum*, Hedw. 2, 8, 10
— **cupulatum*, Hoffm. 8 (*Shoreham, Kemsing*)
— *diaphanum*, Schrad. 2, 6, 8, 9
— *leiocarpum*, Br. & Sch. 2, 3, 8, 9
— *Lyellii*, H. & T. 3, 8 (*Penshurst*, in fruit)
— **rivulare*, Turn. 9 (*Goudhurst*)
— **Sprucei*, Mont. 8 (*Penshurst*), 9 (*Goudhurst*)
Orthotrichum **stramineum*, Hornsch. 8 (*Sevenoaks*)
— **tenellum*, Bruch. 8 (*Penshurst*), 9 (*Goudhurst*)

SPLACHNACEÆ

Splachnum **ampullaceum*, Linn.

I

FUNARIACEÆ

Nanomitrium **tenerum*, Lindb. 9 (*Cranbrook*)
Ephemerum **recurvifolium*, Lindb. 8 (*Sevenoaks, Polehill*)
— *serratum*, C. M. 1, 8
var. *angustifolium*, B. & S. 8
— **sessile*, Rabenh. 9 (*Goudhurst*)

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Ephemerum *stellatum, Philib.
9 (*Goudhurst*)
Physcomitrella *patens, Br. &
Sch. 8 (*Westerham, Pem-
bury Green*)
Physcomitrium pyriforme, Brid.
3, 5, 8
Funaria *ericetorum, Dixon. 2
(*Joydens Wood*), 9 (*Goud-
hurst*)
— fascicularis, Br. & Sch. 8
9
— hygrometrica, Hedw. 1-10

MEESIAEÆ

Aulacomnion androgynum,
Schwaegr. 1 (*Abbey
Wood*, in fruit), 8, 9
— palustre, Schwaegr. 8, 9, 10

BARTRAMIACEÆ

Bartramia pomiformis, Hedw.
1, 8, 9, 10 (*Hythe*)
— *ithyphylla, Bird. 2 (*Hal-
stead*), 9 (*Charing*)
Philonotis *capillaris, Lindb. 8
(*Godden Green*), 9 (*Goud-
hurst*)
— fontana, Brid. 1, 9, 10

BRYACEÆ

Leptobryum pyriforme, Wils.
8, 9
Webera albicans, Schimp. 1, 8
— annotina, Schwaegr.
8 (*Pembury*, in fruit), 9
— carnea, Schp. 1, 2 (*Green-
bithe*, in fruit)
— nutans, Hedw. 1, 8
— *Tozeri, Schimp. 2 (*Swans-
combe Wood*), 9 (*Goud-
hurst*)
Bryum *alpinum, Huds. 1 (*Spring
Park Wood*)
— argenteum, L. 2, 5, 8, 10
— atropurpureum, W. & M.
1, 3, 8
var. gracilentum, Tayl. 1
— bimum, Schreb. 5, 8
— cæspiticium, Linn. 1, 3, 6,
8, 10 (*Shorncliffe*)
— capillare, L. 3, 5, 8
var. cochleariforme. 8
var. torquescens, Husn. 8, 10
— Donianum, Grev. 1, 8 (in
fruit, near *Sevenoaks*) and
10 (*Sandgate*)
— erythrocarpum, Schwaegr. 2, 8
— inclinatum, Bland. 8
— intermedium, Brid. 8
— murale, Wils. 5, 8, 9
— pallens, Sw. 1
— pallescens, Schleich. 8
— pendulum, Schimp. 1, 5, 8
— *provinciale, Philib. 8 (*Ight-
ham*)

Bryum pseudotriquetrum,
Schwaegr. 1, 8, 9
— *roseum, Schreb. 1 (*Eltham*)
8 (*Sevenoaks*), 9 (*Asbford*)
Mnium *affine, Bland. 8 (*Sand-
ling, Ightham*, in fruit on
Peneden Heath), 9 (*Cran-
brook*)
— *cuspidatum, Hedw. 5 (*Sand-
wich*), 8 (*Knole Park, Ightham*)
— hornum, L. 1, 7, 8
— punctatum, L. 2, 7, 8
— rostratum, Schwaegr. 1, 8
(in fruit near *Sevenoaks*),
9, 10
— *stellare, Reich. 7 (*Dover*),
8 (*Langton Green*), 9 (*Char-
ing*)
— undulatum, L. 2, 7, 8
(*Tunbridge Wells*, in fruit)

FONTINALACEÆ

Fontinalis antipyretica, L. 2, 8, 9

CRYPHÆACEÆ

Cryphaea heteromalla, Mohr.
3, 8, 9

NECKERACEÆ

Neckera complanata, Hübn. 1,
8, 9
— *crispa, Hedw. 2, 6, 8, 10
— pumila, Hedw. 6, 8 (*Dunton
Green*, in fruit), 9
Homalia trichomanoides, Br. & S.
2, 8, 9

HOOKERIAEÆ

Pterygophyllum lucens, Brid.
3, 8, 9

LEUCODONTACEÆ

**Antitrichia curtipendula*, Brid.
10 (*Lydd Beach*)
Leucodon sciurioides, Schwaegr.
7, 8, 9
Porotrichum alopecurum, Mitt.
8

LESKEACEÆ

Anomodon viticulosus, Hook. &
Tayl. 2, 6, 8
Heterocladium *heteropterum,
Br. & Sch. 8 (*Sevenoaks, Tunbridge Wells*), 9 (*Goud-
hurst*)
Leptodon *Smithii, Mohr. 5
(*Waldersbare Park*), 7
(*Barham, Dover*)
Leskea polycarpa, Ehrh. 8, 9
Thuidium abietinum, Br. & Sch.
var. hystricosum, Mitt. 2,
8
— *Blandovii, Br. & Sch. 8
(*Tunbridge Wells*)

Thuidium recognitum, Lindb.
1, 2, 8
— tamariscinum, Br. & Sch. 1, 8

HYPNACEÆ

Climacium dendroides, W. & M.
5
Cylindrothecium concinnum, Sch.
2, 8
Camptothecium lutescens, Br.
& Sch. 2, 8, 10 (*Folkestone, in fruit*)
— sericeum, Kindb. 1, 8
Brachythecium albicans, Br. &
Sch. 1, 2, 5 (fruiting near
Deal), 8
— cæspitosum, Dixon. 8, 9
— glareosum, Br. & Sch. 6, 8
— *illecebrum, De Not. 1, 8
(in fruit near *Tunbridge
Wells*), 9, 10
— plumosum, Br. & Sch. 8, 9
— populeum, Br. & Sch. 6, 8, 9
— purum, Dixon. 2, 6 (in fruit
near *Charing*), 8, 10
— rivulare, Br. & Sch. 8, 9
— rutabulum, Br. & Sch. 1, 8, 9
— *salebrosum, Br. & Sch.
6 (*Bredhurst*)
var. *Mildei. 5 (*Deal*),
9 (*Biddenden*)
— velutinum, Br. & Sch.
1, 2, 8, 9
Eurhynchium *abbreviatum,
Schmp. 8 (*Plaxtol*)
— *circinnatum, Br. & Sch. 10
(*Hythe*)
— confertum, Milde. 1, 8, 10
— crassinervium, Br. & Sch.
8 (*Polehill*, in fruit), 9
— *curvisetum, Sch. 10 (*Hythe*)
— megapolitanum, Milde. 1, 5, 8
— murale, Milde. 8, 9
— myosuroides, Schimp. 1, 8
— myurum, Dixon. 8
— piliferum, Br. & Sch. 2, 8, 9
— prælongum, Schimp. 2, 7, 8
— pumilum, Schimp. 1, 8
— rusciforme, Milde. 2, 8, 9
— *striatulum, Br. & Sch. 8
(*Basted, Shipborne*), 9
(*Goudhurst*)
— striatum, Br. & Sch. 1, 8, 10
— Swartzii, Hobk. 2, 6, 8
(*Otford and Maidstone*, in
fruit)
— tenellum, Milde. 2, 8, 9
var. scabellum, Dixon. 2, 8
Plagiothecium *Borrerianum,
Spruce & Suld. 8 (*Ight-
ham, Tunbridge Wells*, in
fruit)
— denticulatum, Br. & Sch. 1,
8, 10
— depressum, Dixon. 2, 8, 10
(*Hythe*)

A HISTORY OF KENT

- Plagiothecium* *latebricola, Br. & Sch. 1 (*Bromley*), 8 (*Ide Hill, Chipstead*), 9 (*Goudhurst*, with gemmæ)
 —**Silesiacum*, Br. & Sch. 1 (*Abbey Wood*), 2 (*Joyden's Wood*), 8 (*Sevenoaks*)
Amblystegium filicinum, De Not. 1, 8
 —**irriguum*, Br. & Sch. 2 (*Farningham, Greenhithe*), 8 (*Ivy Hatch*, in fruit, *Maidstone*), 9 (*Hothfield*)
 —**Juratzkanum*, Schimp. 1 (*Bromley*), 8 (*Kemsing*)
 — *serpens*, Br. & Sch. 2, 8
 var. *angustifolium*, Limpr. 8
 —**varium*, Lindb. 8 (*Kemsing*)
Hypnum aduncum, Hedw. 1, 9, 10
 chrysophyllum, Brid. 1, 2, 8, 9, 10
 —**commutatum*, Hedw. 8 (*Southborough*)
 —**cordifolium*, Hedw. 8 (*Tonbridge*), 9 (*Cranbrook*), 10 (*Westenhanger*)
 — *cupressiforme*, L. 1 (*Greenhithe*), 2 (*Shoreham*)
 var. *ericetorum*, 1, 8
 — *cuspidatum*, L. 1, 8, 9
 —**elodes*, Spruce. 5
 — *exannulatum*, Gumb. 1, 2, 8
 var. *falcifolium*, Dixon. 9
 — *fluitans*, L. 1, 2
 — *hispidulum*, Brid.
 var. *Sommerfeltii*, Myr. 2, 8, 10
 —**lycopodioides*, Schwaegr. 8 (*Tunbridge Wells*)
 — *molluscum*, Hedw. 2, 7, 8
 Patientiæ, Lindb. 8
 —**polygamum*, Schimp. 5 (*Deal*), 10 (*Westenhanger*)
 — *riparium*, L. 2, 3, 8, 9
 — *Schreberi*, Schimp. 1, 2, 8
 — *stellatum*, Schreb. 1 (*Bexley*), 7, 8
 var. *protensum*, B. & S. 8
 —**stramineum*, Dicks. 8 (*Tunbridge Wells*), 9 (*Goudhurst*)
Hylocomium **brevirostre*, Br. & Sch. 8 (*Hungershall Rocks*, in fruit, *Langton Green*)
 — *loreum*, Br. & Sch. 8, 9 (*Charing*, in fruit)
 — *splendens*, Br. & Sch. 3, 5, 8
 — *squarrosum*, Schimp. 1, 8
 — *triquetrum*, Schimp. 2, 8, 9 (*Charing*, in fruit)

SCALE-MOSSES (*Hepaticæ*).

A list of the Scale-mosses of Kent was published by the writer in the *Journal of Botany* for 1878, pp. 43-54. Since that date a few more species have been added by the writer, and by Mr. L. J. Cocks, of Bromley. The species which are met with in the neighbouring county of Sussex on damp, shady, arenaceous rocks, are almost entirely absent from Kent. Unlike the mosses and lichens, subalpine species of scale-mosses have not been observed on Lydd Beach. The arrangement of the species, and the nomenclature adopted here, is that of Dumortier in his *Hepaticæ Europææ*.

MARCHANTIACEÆ

- Asterella* **hemispherica*, Beauv. 1, 2, 9
Conocephalus conicus, Dumort. 7, 8, 9
Lunularia cruciata, Dumort. 8, 9
Marchantia polymorpha, Linn. 1, 8, 9
Preissia **commutata*, Nees. 5

RICCIACEÆ

- Riccia* *glauca*, Linn. 8, 9
 var. *minima*, Lind. 1
 —**crystallina*, Linn. 1
Ricciella *fluitans*, A. Br. 8, 9

JUNGERMANNIACEÆ

- Frullania* *dilatata*, Dumort. 1, 7, 8
 — *Tamarisci*, Dumort. 2, 8 (*Sevenoaks*), 10 (*Lydd Beach*)
Lejeunea **minutissima*, Dumort. 2 (*Morant's Court Hill*)
 — *serpyllifolia*, Lib. 2
Radula *complanata*, Dumort. 2, 8, 9
Porella *platyphylla*, Lindb. 1, 2, 3, 6 (in fruit sparingly near *Kemsing*)
Lepidozia *reptans*, Dumort. 2, 8

JUNGERMANNIACEÆ (continued)

- Cephalozia* *connivens*, Lindb. 1
 — *divaricata*, Dumort. 1, 2, 8
 —**Lammersiana*, Hüben. 1
 —**lunulæfolia*, Dumort. 8 (*Tunbridge Wells*)
Gymnocolea *affinis*, Dumort. 7, 8
Lophocolea *bidentata*, Dumort. 1, 8, 9
 — *heterophylla*, Dumort. 1, 2, 8
Chiloscyphus **polyanthus*, Corda. 1, 8 (in fruit at *Ashurst* and *Abbey Wood*)
Harpanthus **scutatus*, Spruce. 8 (*Hungershall Rocks*)
Kantia **arguta*, Nees. 8 (*Sevenoaks*)
 — *trichomanis*, Gray. 1, 3, 7, 8
Blepharostoma **trichophylla*, Dumort. 8 (*Hungershall Rocks*)
 — *setacea*, Mitt. 1, 3, 9
Scapania *compacta*, Dumort. 8
 — *curta*, Dumort. 9
 — *nemorosa*, Dumort. 1, 2, 8
Diplophyllum *albicans*, Dumort. 8
Plagiochila *asplenioides*, Dumort. 2, 7, 8, 9
Jungermannia *attenuata*, Lindb. 1, 8
 — *crenulata*, Sm. 1, 8, 9

JUNGERMANNIACEÆ (continued)

- Jungermannia* *capitata*, Hook. 8
 —**exsecta*, Schmid. 1, 8
 — *incisa*, Schrad. 8
 —**inflata*, Huds. 1 (*Keston Common*)
 —**pumila*, Dumort. 8 (*Hungershall Rocks*)
 —**sphaerocarpa*, Dumort. 1 (*Bexley, Hadlow*)
 — *ventricosa*, Dicks. 8, 9
Nardia *emarginata*, Gray. 8 (*Rusthall Common*)
 — *scalaris*, Gray. 1, 8
Fossombronina **cæspitiformis*, De Not. 9 (*Goudhurst*)
 — *pusilla*, Nees. 8, 9
Blasia **pusilla*, Linn. 8 (*Langton Green*)
Pellia *calycina*, Tayl. 1, 8, 9
 — *epiphylla*, Raddi. 3, 5, 7, 8
Metzgeria *furcata*, Dumort. 2, 5 (in fruit, near *Deal*), 8 (*Seal*), 9 (*Ashford*)
Riccardia *multifida*, Gray. 1, 2, 7, 8
 — *pinguis*, Gray. 1, 9 (*Ashford*)
Anthoceros **lævis*, Linn. 8 (*Speldhurst, Goudhurst*)
 —**punctatus*, Linn. 8 (*Woolwich Heath, Rusthall Common*), 9 (*Goudhurst*)

BOTANY

FRESHWATER ALGÆ.

The freshwater algæ of Kent have never been carefully worked out, except in the immediate neighbourhood of Tunbridge Wells. The most complete list that has been published is that given in Jenner's *Flora of Tunbridge Wells*. To this list is now added a number of species collected by the writer in the neighbourhood of Sevenoaks, and some diatoms collected by the late Dr. E. Capron at Northfleet and Folkestone. But there are many localities in Kent that would probably yield a large number of species not yet detected in the county, such as the marsh ditches near the estuaries of the Thames and Medway, and those around Minster and Grove Ferry, and on the coast near Deal and Reculver. Others would unquestionably be found in the ponds scattered throughout the county. The following list must therefore not be regarded as a fully representative one.

CYANOPHYCEÆ

CHROOCOCCACEÆ

- Glæocapsa arenaria*, Rabenh.
Tunbridge Wells
Merismopædia punctata,
Meyen. *Tunbridge Wells*

OSCILLATORIACEÆ

- Arthrospira Jenneri*, Stiz.
Tonbridge
Lyngbya vermicularis, Hass.
Rusthall Common.
Oscillatoria nigra, Vauch.
Sevenoaks
— *tenuis*, C. Ag. *Tunbridge Wells*
— *terebriformis*, C. Ag. *Tunbridge Wells*
Phormidium autumnale, Gom.
Tunbridge Wells

RIVULARIACEÆ

- Rivularia hæmatites*, C. Ag.
Riverhead

NOSTOCACEÆ

- Anabæna spiralis*, Thomps.
Tunbridge Wells
Nostoc commune, Vauch.
Kemsing, Westerham

BACILLARIACEÆ

NAVICULACEÆ

- Amphipleura pellucida*, Kütz.
Shoreham, Tunbridge Wells
Navicula viridis, Kütz. *Tunbridge Wells*

- Pleurosigma Hippocampus*,
W. Sm. *Shoreham*

- Scoliopleura Westii*, Grun.
Northfleet

CYMBELLACEÆ

- Cymbella Cistula*, Hempr.
Westerham
— *lanceolatum*, Ehr. *Shoreham*

- Encyonema prostratum*, Ralfs.
Sandhurst

GOMPHONEMACEÆ

- Gomphonema acuminatum*,
Ehr. *Tunbridge Wells*
— *augur*, Ehr. *Shoreham*
— *constrictum*, Ehr. *Speldhurst, Shoreham*
— *exiguum*, Kütz. *Westerham*

ACHNANTHACEÆ

- Achnanthes minutissima*, Kütz.
Westerham, Shoreham, Sevenoaks

NITZSCHIACEÆ

- Nitzschia acuminata*, Grun.
Tilbury
— *circumsuta*, Grun. *Northfleet*
— *navicularis*, Grun. *Northfleet*
— *sigmoidea*, W. Sm. *Otford, Shoreham*

SURIRELLACEÆ

- Suriraya biseriata*, Bréb. *Northfleet*
— *striatula*, Turp. *Otford, Shoreham*
Campylodiscus bicoastatus, W. Sm. *Northfleet*
— *echeneis*, Ehr. *Folkestone*
— *Thuretii*, Bréb. *Folkestone*

DIATOMACEÆ

- Diatoma elongatum*, C. Ag.
Tunbridge Wells
— *vulgare*, Bory. *Otford, Shoreham, Tunbridge Wells, Sevenoaks*

MERIDIONACEÆ

- Meridion circulare*, Ralfs.
Shoreham, Tunbridge Wells
— *constrictum*, Ralfs. *Tunbridge Wells*

FRAGILARIACEÆ

- Fragilaria capucina*, Desmaz.
Shoreham
— *gibba*, Ehr. *Tunbridge Wells*

- *pectinalis*, Lyngb. *Tunbridge Wells*
— *virescens*, Ralfs. *Tunbridge Wells*

- Synedra affinis*, Kütz. *Pembury*
— *Ulna*, Ehr. *Shoreham, Speldhurst*

STRIATELLACEÆ

- Tabellaria fenestrata*, Kütz.
Tunbridge Wells
— *flocculosa*, Kütz. *Tunbridge Wells*

EUNOTIACEÆ

- Pseudeunotia lunaris*, Grun.
Lamberhurst, Goudhurst

BIDDULPHIACEÆ

- Denticella rhombus*, Ehr. *Folkestone*
Triceratium alternans, Bréb. *Folkestone*
— *favus*, Ehr. *Folkestone*
— *spinosum*, Bail. *Folkestone*
— *striolatum*, Ehr. *Folkestone*

MELOSIRACEÆ

- Lysigonium varians*, De Toni.
Shoreham, Tunbridge Wells
Melosira arenaria, Moore.
Shoreham, Westerham

DESMIDIACEÆ

- Arthrodesmus convergens*, Ehr.
Rusthall Common
Closterium Leibleinii, Kütz.
Rusthall Common
— *Lunula*, Nitzsch. *Rusthall Common*
— *Ralfsii*, Bréb. *Rusthall Common*

- *striolatum*, Ehr. *Kent*
Cosmarium Botrytis, Menegh. *Tunbridge Wells*
— *margaritifera*, Menegh. *Rusthall Common*
— *pyramidatum*, Bréb. *Rusthall Common*

- Desmidium Swartzii*, C. Ag.
Rusthall Common

- Disphinctium quadratum*,
Hansg. *Rusthall Common*
Euastrum oblongum, Ralfs.
Rusthall Common

- *verrucosum*, Ehr. *Rusthall Common*

- Hyalotheca dissiliens*, Bréb.
Tunbridge Wells

- *mucosa*, Ehr. *Tunbridge Wells*

- Pleurotænium Trabecula*, Naeg.
Rusthall Common

- Pleurotæniopsis Cucumis*,
Lagerh. *Rusthall Common*

- Sphærososma vertebratum*,
Ralfs. *Rusthall Common*

A HISTORY OF KENT

DESMIDIACEÆ (continued)

- Staurastrum alternans*, Bréb.
Rusthall Common
— *dilatatum*, Ehr. Rusthall
Common
— *orbiculare*, Ralfs. Tun-
bridge Wells
Xanthidium aculeatum, Ehr.
Tunbridge Wells
— *armatum*, Bréb. Tunbridge
Wells
— *fasciculatum*, Ehr. Tun-
bridge Wells

MOUGEOTIACEÆ

- Mougeotia genuflexa*, C. Ag.
Tonbridge
— *recurva*, De Toni. Rusthall
Common
Spirogyra arcta, Kütz.
var. *catenæformis*, Kirchn.
Rackham Common
— *decimina*, Kütz. Westerham
— *elongata*, Kütz. Pembury
— *gracilis*, Kütz. Tunbridge
Wells
— *Hassallii*, Petit. Sandhurst
— *inflata*, Rabenh. Rusthall
Common
— *mirabilis*, Kütz. Tunbridge
Wells
— *neglecta*, Kütz. Rusthall
Common
— *nitida*, Link. Sevenoaks
— *portalis*, Cleve. Kemsing
— *tenuissima*, Kütz. Hawk-
hurst
— *varians*, Kütz. Speldhurst

PALMELLACEÆ

- Palmella hyalina*, Rabenh.
Tunbridge Wells
Pediastrum Boryanum,
Menegh. Tunbridge Wells
Scenedesmus quadricaudatus,
Bréb. Shoreham
Tetraspora lubrica, C. Ag.
Stone Street
ULVACEÆ
Enteromorpha intestinalis,
Link. Tonbridge
Monostroma bullosum, With.
Tonbridge, Kemsing
Prasiola crispa, C. Ag. Tun-
bridge Wells

CONFERVACEÆ

- Draparnaldia plumosa*, C. Ag.
Chipstead

CHÆTOPHORACEÆ

- Chætophora endiviæfolia*, C. Ag.
Riverhead
— *tuberculosa*, Hook. Tun-
bridge Wells

CHROOLEPIDACEÆ

- Trentepohlia aurea*, Mart.
Chipstead

ÆDOGONIACEÆ

- Bulbochæte setigera*, C. Ag.
Tunbridge Wells, Goud-
hurst
Ædogonium æquale, Kütz.
Rusthall Common
— *Boscii*, Bréb. Rusthall
Common
— *cardiacum*, Kütz. Hook
Green

ÆDOGONIACEÆ (continued)

- Ædogonium concatenatum*,
Wittr. Lamberhurst
— *inæquale*, Kütz. Rusthall
Common
— *Mulleri*, Kütz. Rusthall
Common
— *Rothii*, Wittr. Rusthall
Common
— *vernale*, Wittr. Rusthall
Common

CLADOPHORACEÆ

- Cladophora crispata*, Kütz.
Riverhead
— *glomerata*, Kütz. Wester-
ham, Shoreham

BOTRYDIACEÆ

- Botrydium granulatum*, Grev.
Ash

VAUCHERIAACEÆ

- Vaucheria dichotoma*, C. Ag.
Sevenoaks
— *sessilis*, DC. Rusthall Com-
mon
— *terrestris*, Lyngb. Seven-
oaks

RHODOPHYCEÆ

BANGIACEÆ

- Porphyridium cruentum*, Næg.
Sevenoaks

HELMINTHOCOLIACEÆ

- Batrachospermum moniliforme*,
Roth. Keston, Kemsing,
Riverhead, Maidstone
— *pyramidale*, Sirod. Tun-
bridge Wells

MARINE ALGÆ

The coast of Kent, owing to the geological character of the cliffs, is not remarkable for rock pools, and consequently a large number of species of marine algæ found on the rocky western coast of England in much the same latitude have not been found in this county. But only a comparatively small portion of the coast has been explored by algologists, with the exception of the neighbourhood of Deal by Mr. J. T. Neeve. His search was rewarded by the discovery of three species, new not only to the British Isles, but to science, viz. *Neevea repens*, Batt. *Erythropeltis discigera*, Schm. var. *Flustra*, Batt. and *Gonimophyllum Buffhami*, Batt. *Rhodymenia corallicola*, Ardis., another species new to this country, has as yet only been found in Kent. The neighbourhood of Folkestone has been examined at intervals by Mr. J. Cosmo Melvill, that of Sandgate by Mr. E. M. Holmes, that of Chatham by Dr. J. W. S. Meiklejohn, and that of Margate by the late Mr. T. H. Buffham. The list at present includes rather less than one-third of the known British species, but it is quite probable that a careful search near the mouth of the rivers Thames and Medway, and on the coast of Romney Marsh might add considerably to the number, especially of the *Cyanophyceæ* and *Chlorophyceæ*.

CYANOPHYCEÆ

CHAMÆSPHONACEÆ

- Dermocarpa violacea*, Crn.
Deal (E. B.)
— *prasina*, Born. Folkestone
and Sandgate (on *Gelidium crinale*, J. Ag.);
Deal, on *Gigartina mam-
millosa* and on *Laurencia
pinnatifida*

OSCILLATORIACEÆ

- Lyngbya Agardhii*, Gom. Mar-
gate (E. B.)
Hydrocoleum, lyngbyaceum,
Kütz. var. *rupestre*, Kütz.
Folkestone (E. B.)
Calothrix confervicola, C. Ag.
Dover
— *scopulorum*, C. Ag.
Dover

NOSTOCACEÆ

- Nostoc Linckia*, Born. Graves-
end

CHLOROPHYCEÆ

PALMELLACEÆ

- Glæocystis adnata*, Næg. Dover

ULVACEÆ

- Pringsheimia scutata*, Reinke.
Margate

BOTANY

ULVACEÆ (continued)

- Monostroma fuscum, Wittr.
var. Blyttii, Wittr.
Dover
— Lactuca, J. Ag. Deal
Enteromorpha marginata, J.
Ag. Dover
— micrococca, Kütz.
var. tortuosa, J. Ag. Sand-
gate
— compressa, Grev. Deal,
Folkestone, Chatham
— Linza, J. Ag. Folkestone,
Chatham
— intestinalis, Link. Deal,
Folkestone, Chatham
— percursa, C. Ag. Deal
— erecta, J. Ag. Deal
Ulva Lactuca, L.
var. latissima. Folkestone,
Deal, Chatham

ULOTRICHACEÆ

- Ulothrix flacca, Thur. Deal,
Sandgate

CHÆTOPHORACEÆ

- Epicladia Flustræ, Batt. Deal,
Folkestone

CLADOPHORACEÆ

- Chætomorpha Melagonium,
Kütz. Deal, Folkestone
— Linum, Kütz. Folkestone
— tortuosa, Kütz. Folkestone
Rhizoclonium riparium, Harv.
Deal
Cladophora pellucida, Kütz.
Folkestone
— rupestris, Kütz. N. and S.
Foreland, Folkestone, Deal,
Ramsgate, Chatham
— utriculosa, Kütz. Folke-
stone
var. falcata, H. and B.
Deal, on Cer. rubrum
— glaucescens, Harv. Deal
— albida, Kütz. Folkestone,
Sandgate
— Hutchinsii, Harv.
var. distans, Kütz. Folke-
stone, abundant
— arcta, Kütz. Deal
— lanosa, Kütz. Dover

BRYOPSISACEÆ

- Bryopsis plumosa, C. Ag.
Folkestone, N. and S.
Foreland

PHÆOPHYCEÆ

DESMARESTIACEÆ

- Desmarestia aculeata, Lamour.
Folkestone, Dover, Deal
— ligulata, Lamour. Folke-
stone, Dover, Deal

DICTYSIPHONACEÆ

- Dictysiphon feniculaceus,
Grev. Deal

PUNCTARIACEÆ

- Phleospora brachiata, Born.
Folkestone
Punctaria plantaginea, Grev.
Folkestone

- latifolia, Grev. Chatham
Striaria attenuata, Grev. Deal

SCYTOSIPHONACEÆ

- Scytosiphon lomentarius, J.
Ag. Dover, Deal

ASPEROCOCCACEÆ

- Asperococcus echinatus, Grev.
Dover.

ECTOCARPACEÆ

- Ectocarpus minimus, Näg. In
the receptacles of Himan-
thalia lorea, Lyngb. Dover
— velutinus, Kütz. Deal
— siliculosus, Kütz. Folke-
stone, Sandgate, Dover
var. typica, Kjellm. Deal
— fasciculatus, Harv. Deal,
Sandgate
— tomentosus, Lyngb. Dover,
Folkestone
— granulosus, C. Ag. Sand-
gate

- Pylaiella littoralis, Kjellm.
f. typica, Kjellm. Deal,
Dover, Chatham
Isthmoplea sphærophora,
Kjellm. Sandgate
Myriotrichia clavæformis,
Harv. Deal
— filiformis, Harv. Deal

CHORDACEÆ

- Chorda Filum, Stackh. Deal,
Dover, Folkestone, Margate

LAMINARIACEÆ

- Laminaria saccharina, Lamx.
Deal, Folkestone
— digitata, Lam.
f. typica, Fosl. Folkestone
— Cloustonii, Edm. Sand-
gate, Deal, Chatham
Saccorhiza bulbosa, De la Pyl.
Dover.

FUCACEÆ

- Fucus vesiculosus, Linn. Deal,
Chatham, Folkestone
— serratus, Linn. Sandgate,
Folkestone, Deal, Dover,
Chatham
Ascophyllum nodosum, Le Jol.
Dover, Sandgate, Folkestone
var. minor, Turn. Dover
Pelvetia canaliculata, Decne. et
Thur. Chatham, Folke-
stone

- Himanthalia lorea, Lyngb.
Deal

- Cystoseira fibrosa, C. Ag. Deal
(floated in)

ELACHISTACEÆ

- Elachista fucicola, Fries. Deal
— scutulata, Duby. Deal

SPHACELARIACEÆ

- Sphacelaria cirrhosa, C. Ag.
var. pennata. Deal, Dover,
Folkestone

- plumigera, Holmes. East
Wear Bay, Herne Bay

- Cladostephus spongiosus, C.
Ag. Sandgate, Folkestone,
Ramsgate, Deal, S. Fore-
land

- verticillatus, C. Ag. Folke-
stone

- Stypocaulon scoparium, Kütz.
Folkestone, Dover, Deal,
Margate

MYRIONEMACEÆ

- Myrionema strangulans, Grev.
var. typica. Folkestone,
Dover

DICTYOTACEÆ

- Dictyota dichotoma, Lamour.
N. Foreland, Folkestone.
var. implexa, J. Ag.
Folkestone

- Padina pavonia, Gaill.
Dover, Margate

RHODOPHYCEÆ

PORPHYRACEÆ

- Neevia repens, Batt. Deal
Erythrotrichia Boryana, Berth.
Folkestone
Erythropeltis discigera, Schm.
var. Flustræ, Batt. Deal
Bangia fuscopurpurea, Lyngb.
Deal

- Porphyra laciniata, J. Ag.
var. umbilicata, J. Ag.
Folkestone, Deal, Sheer-
ness (E. B.)

HELMINTHOCADIACEÆ

- Acrochætium virgatulum, J.
Ag. Dover

CHÆTANGIACEÆ

- Choreocolax Polysiphonia,
Reinsch. Folkestone, Deal
(J. T. N.)

GELIDIACEÆ

- Harveyella mirabilis, Schmitz
et Rke. Deal

WRANGELIACEÆ

- Naccaria Wiggii, Endl. Folke-
stone

- Gelidium crinale, J. Ag. Folke-
stone, Sandgate

- corneum, Lamour, Deal

GIGARTINACEÆ

- Chondrus crispus, Stackh.
Sandgate, N. Foreland,
Folkestone, Deal

- Gigartina mamillosa, J. Ag.
f. genuina, Batt. Deal,
Sandgate, Folkestone
f. acuta, Good. and
Woodw. Deal
f. prolifera, Turn. Deal

A HISTORY OF KENT

GIGARTINACEÆ (continued)

- Phyllophora rubens*, Grev.
Folkestone, Dover, S. Foreland, Deal, Ramsgate
— *membranifolia*, J. Ag.
Folkestone, Deal, Dover;
a narrow form occurs at Deal
Gymnogongrus Griffithsia,
Mart. Sandgate (E. M. H.)
— *Norvegicus*, J. Ag. Dover,
S. Foreland, Deal
Ahnfeldtia plicata, Fries.
Folkestone, Deal, Chatham
Actinococcus peltiformis,
Schmitz. Deal
Colacolepis incrustans, Schmitz.
Deal
Callophyllis laciniata, Kütz.
Deal
RHODOPHYLLIDACEÆ
Cystoclonium purpurascens,
Kütz. Dover, Deal
Catenella Opuntia, Grev.
Dover
Rhodophyllis bifida, Kütz.
Deal
— *appendiculata*, J. Ag. Deal
Sphaerococcus coronopifolius,
Grev. Deal
Gracilaria confervoides, Grev.
Deal
Calliblepharis ciliata, Kütz.
Dover, Deal, Folkestone,
Ramsgate
— *jubata*, Kütz. Folkestone
Rhodymenia palmetta, Grev.
f. *typica*, Batt. Deal
f. *flabelliformis*, Kütz.
Deal
— *corallicola*, Ardiss. Deal
— *palmetta*, Grev. Folkestone,
Sandgate, Deal
Cordylecladia erecta, J. Ag.
Folkestone
Lomentaria articulata, Lyngb.
Dover, Deal, Folkestone,
Sandgate
— *clavellosa*, Gaill. Deal
— *rosea*, Thur. Ramsgate
(T. H. B.)
Chylocladia kaliformis, Grev.
Folkestone
Plocamium coccineum, Lyngb.
Folkestone, Dover, Deal,
Chatham
Nitophyllum laceratum, Grev.
Deal

RHODOPHYLLIDACEÆ (continued)

- Nitophyllum Gmelini*, Harv.
Deal
Gonimophyllum Buffhami,
Batt. Deal
Delesseria alata, Lamour.
Folkestone, S. Foreland,
Chatham
— *Hypoglossum*, Lamour.
Folkestone, Deal
— *ruscifolia*, Lamour. Dover,
Deal
— *sinuosa*, Lamour. Folke-
stone
— *sanguinea*, Lamour. Folke-
stone, Deal, Chatham
RHODOMELACEÆ
Rhodomela subfusca, C. Ag.
Folkestone, S. Foreland,
Chatham
Laurencia caespitosa, Lamour.
Folkestone, Sandgate
— *pinnatifida*, Lamour. Folke-
stone, Dover, S. Foreland
Halopithys pinastroides, Kütz.
Deal, Folkestone
Chondria dasyphylla, C. Ag.
Folkestone, Dover, Deal
Polysiphonia elongata, Grev.
Deal
— *fibrillosa*, Grev. N. Fore-
land
— *fastigiata*, Grev. Deal,
Folkestone, Sandgate
— *atrorubescens*, Grev. Deal
— *nigrescens*, Grev. Folke-
stone, Dover, S. Foreland,
Ramsgate
var. *affinis*, J. Ag. Rams-
gate
— *violacea*, Grev. Kent
— *Brodiaei*, Grev.
var. *typica*, Holmes and
Batt. Folkestone
Brongniartella byssoides, Bory.
S. Foreland
Heterosiphonia coccinea,
Schmitz. Folkestone, Deal
CERAMIACEÆ
Spermothamnion Turneri,
Aresch.
var. *monoica*, Schm. Deal
— *strictum*, Ard. Sandgate
Griffithsia barbata, C. Ag.
Folkestone
— *corallina*, C. Ag. Folkestone
— *setacea*, C. Ag. S. Foreland,
Folkestone

CERAMIACEÆ (continued)

- Halurus equisetifolius*, Kütz.
Folkestone, Deal
Rhodochorton floridulum, Näg.
S. Foreland
Callithamnion polyspermum,
C. Ag. Folkestone
— *granulatum*, C. Ag. Folke-
stone
— *roseum*, Harv. Folkestone
— *corymbosum*, Lyngb. Kent
(E. B.)
Plumaria elegans, Schm. Folke-
stone, Dover, S. Foreland
Antithamnion Plumula, Thur.
Folkestone
Ceramium rubrum, C. Ag.
Folkestone, Sandgate, Deal,
Chatham
— *diaphanum*, Roth. S. Fore-
land
— *Deslongchampsii*, Chauv.
Deal
— *flabelligerum*, C. Ag. Folke-
stone, Dover, S. Foreland
— *ciliatum*, Ducluz. Chatham
— *gracillimum*, Harv. Folke-
stone
CRYPTONEMIACEÆ
Gloiosiphonia capillaris, Carm.
Sbeerness
Dumontia filiformis, Grev.
Folkestone, Deal
Dilsea edulis, Stackh. S. Fore-
land
Furcellaria fastigiata, Lamour.
Folkestone, Dover, Deal,
Chatham
RHIZOPHYLLIDACEÆ
Polyides rotundus, Grev.
Folkestone, Dover, Deal
Petrocelis cruenta, J. Ag.
Folkestone
HILDENBRANDTIACEÆ
Hildenbrandtia prototypus,
Nardo. Deal
CORALLINACEÆ
Melobesia zonalis, Fosl. Deal
— *corticiformis*, Kütz. Deal,
Folkestone
Lithothamnion polymorphum,
Aresch. Folkestone, Sand-
gate, Deal
Corallina officinalis, Linn.
Folkestone, Sandgate, Dover,
Deal, Chatham,
— *rubens*, Ellis et Sol. Folke-
stone

CHARACEÆ.

Chara fragilis Desv. type has been noted in four localities, and var. *Hedwigii* Kuetz. in three. *C. hispida*, L. is not uncommon near the sea and tidal waters; what we believe to be the var. *rudis* (Braun) was found by Mr. Dowker at Ham Ponds. *C. vulgaris*, L., by far the most frequent species in the county, has occurred in every district, either as the type or var. *longibracteata* Kuetz. or the sub-maritime var. *papillata* Wallr. The only known stations

BOTANY

for *Tolypella glomerata* Leonh. are Plumstead Marshes and Folkestone Warren; the scarce *T. prolifera* Leonh. being restricted to ditches near Snodland. *Nitella flexilis* Agardh, collected once near West Peckham, and *N. opaca* Agardh, from six stations in districts 7, 8 and 9, complete our somewhat meagre list.

LICHENS (*Lichenes*).

The lichen flora of Kent is peculiar in relation to subalpine species, which are mostly confined to the district known as Lydd Beach. These probably have grown from spores carried by the wind from Devon, or from the opposite French coast.

The published records of lichens for Kent are comparatively few. Many of those given by Foster and Jenner, in the *Flora of Tunbridge Wells*, have now disappeared, and the list given by the present writer in the *Journal of Botany* for 1888 has since had little added to it.

In the following list the rarer species are marked with an asterisk. The classification adopted is that of Crombie's *British Lichens* as far as the genus *Pertusaria*, and beyond that genus, that of the third edition of Leighton's *Lichen Flora of Great Britain*.

COLLEMACEI

- Collema cheileum, Ach. 8, 9
- crispum, Ach. 2, 8 (*Westerham*)
- *furvum, Ach. 9 (*Staplehurst*), 10 (*Lymington*)
- *glaucescens, Hoffm. 2 (*Chislehurst*)
- *nigrescens, Ach. 2, 8, 10 (in fruit near *Halstead*)
- pulposum, Ach. 1, 5, 9, 10, sub-sp. ceranoides, Nyl. 2 (*Chislehurst*)
- Collemodium *biatorinum, Nyl. 8 (*Maidstone*)
- *microphyllum, Nyl. 3 (*Selling*), 10 (*Folkestone*)
- *plicatile, Nyl. 8 (*Maidstone*), 9 (*Boughton Monchelsea*)
- Schraderi, Nyl. 2, 8 (in fruit at *Shoreham* and *Kemsing*), 10
- turgidum, Nyl. 8, 10
- Leptogium *cretaceum, Nyl. 10 (*Folkestone*, in fruit)
- lacerum, Ach. 2, 8, 10
- *microscopicum, Nyl. 8 (*Maidstone*)
- *minutissimum, Fr. 2 (*Halstead*)
- scotinum, Fr. 5, 6 var. sinuatum, Malbr. 5
- Collemopsis *diffundens, Nyl. 8 (*Maidstone*)
- *Schæreri, Nyl. 8 (*Maidstone*, *Kemsing*)
- Pyrenidium *actinellum, Nyl. 8 (*Maidstone*)

LICHENACEI

CALICIEI

- Calicium *chrysocephalum, Ach. 8 (*Shipbourne*, *Penshurst*)
- curtum, Turn. and Borr. 8, 10
- hyperellum, Ach. 8
- melanophæum, Ach. var. ferrugineum, Schær. 8

CALICIEI (continued)

- Calicium parietinum, Ach. 8
- *phæocephalum, Turn. and Borr. 8 (*Tunbridge Wells*)
- quercinum, Pers. 8, 10
- trachelinum, Ach. 6, 8
- Coniocybe *furfuracea, Ach. 1 (*Chislehurst*)
- Sphinctrina turbinata, Pers. 5, 8
- Trachylia tympanella, Fr. 8
- SPHÆROPHOREI
- Sphærophoron *coralloides, Pers. 8 (*Hungershall Rocks*)

BÆOMYCEÆI

- Bæomyces roseus, Pers. 8
- rufus, DC. 8
- Cladonia *alcicornis, Flk. 10 (*Lydd Beach*)
- cæspiticia, Flk. 8
- cariosa, Flk. 8
- cervicornis, Schaer. 8
- degenerans, Flk. var. amœna, Ach. 1
- delicata, Flk. 2 var. subsquamosa, Nyl. 8
- digitata, Hoffm. 8 var. ostreatiformis, Leight. 8
- fimbriata, Fr. 2
- furcata, Hoffm. 8 var. recurva, Hoffm. 10
- gracilis, Hoffm. 10
- macilenta, Hoffm. 1, 8
- pungens, Flk. 8 f. foliosa, Flk. 10
- pyxidata, Fr. 1, 7, 8, 9
- Cladonia rangiferina, Hoffm. 1, 8
- subsquamosa, Nyl. 8
- sylvatica, Hoffm. 8

RAMALINEI

- Ramalina calicaris, Hoffm. var. canaliculata, Fr. 5, 9 (*Hothfield*, in fruit), 10
- var. subampliata, Nyl. 10
- evernioides, Nyl. 8, 9, 10
- farinacea, Ach. 1, 3, 8, 9, 10

RAMALINEI (continued)

- Ramalina fastigiata, Ach. 2, 8, 9
- fraxinea, Ach. 1, 6, 9 (*Postling*, in fruit)
- pollinaria, Ach. 6, 8, 9 f. humilis, Ach. 8

USNEI

- Usnea ceratina, Ach. 10 var. scabrosa, Ach. 10 f. ferruginascens, Cromb. 3, 8, 10
- florida, Ach. 10
- hirta, Hoffm. 10

ALECTORIEI

- Alectoria *jubata, Nyl. sub-sp. chalybeiformis, Ach. 8 (*Rusthall Common*)

CETRARIEI

- Cetraria aculeata, Fr. 5 (*Sandwich*)
- f. acanthella, Nyl. 10 (*Lydd Beach*)
- f. hispida, Cromb. 10 (*Lydd Beach*)
- Platysma *sæpincola, Nyl. 5 (near *Ripple Court*, in fruit)
- *diffusum, Nyl. 8 (*Penshurst*, *Sevenoaks*)

PARMELIEI

- Evernia prunastri, Ach. 8 (*Penshurst* and *Wrotham*, in fruit), 9, 10 var. *stictocera, Hook. 5 (*Sandwich*), 10 (*Lydd Beach*)
- Parmelia *acetabulum, Dub. 7 (*Broome Park*), 8 (fruiting in *Penshurst Park*)
- Borreri, Turn. 8 (*Westerham*, in fruit)
- caperata, Ach. 2, 6, 8, 10
- exasperata, Nyl. 1, 8, 9, 10
- *fuliginosa, Nyl. 8 (*Ighiteham*, *Rusthall Common*)
- lævigata, Ach. 2, 6, 8, 9
- perforata, Wulf. 3, 7, 10 sub-sp. *ciliata, Nyl. 8 (*Lydd*, in fruit)

A HISTORY OF KENT

PARMELIEI (continued)

- Parmelia perlata, Ach. 1, 6, 8
- physodes, Ach. 1, 8
 - f. labrosa, Ach. 8
 - f. tubulosa, Mudd. 10
- subaurifera, Nyl. 3, 8
- sulcata, Tayl. 8
- tiliacea, Ach. 8
- Parmeliopsis *ambigua, Nyl. 8 (Sevenoaks, Ightham)

STICTIEI

- Stictina *fuliginosa, Nyl. 10 (Lydd Beach)
- *limbata, Nyl. 10 (Lydd Beach)
- Lobaria *scrobiculata, Nyl. 10 (Lydd Beach, Ightham)
- *pulmonaria, Hoffm. 10
- Ricasolia *lætevirens, Leight. 6 (Wye)
- Nephromium *lusitanicum, Nyl. 10 (Lydd Beach)
- Peltigera canina, Hoffm. 1, 5, 6, 8
- horizontalis, Hoffm. 8 (Ightham)
- polydactyla, Hoffm. 1 (Halstead), 8, 10
- *rufescens, Hoffm. 3 (Canterbury), 8 (Lamberhurst)
- *spuria, Leight. 3 (Canterbury), 8 (Sevenoaks)

PHYSICIEI

- Physcia *astroidea, Nyl. 7 (Broome Park, in fruit), 8 (Maidstone, Tunbridge Wells)
- caesia, Nyl. 2 (Cobham)
- ciliaris, D. C. 7, 8, 9
 - var. actinota, Ach. 10
- *erosa, Leight. 8 (Dunton Green, Penshurst), 9 (Egerton)
- *flavicans, D. C. 10 (Beachborough Park, Lydd Beach)
- lichnea, Nyl. 2, 8
- parietina, De Not. 1 (Sidcup), 6, 8, 9
- pulverulenta, Nyl. 8
 - sub-sp. pityrea, Nyl. 6, 8, 10
 - sub-sp. venusta, Nyl. 8
- stellaris, Nyl.
- sub-sp. tenella, Nyl. 8
- ulothrix, Nyl.
 - var. virella, Cromb. 1, 6, 8

LECANOREI

- Pannaria nigra, Nyl. 8, 10
- *rubiginosa, Del.
 - var. cœruleo-badia, Mudd. 1 (Charlton)
- Coccocarpia *plumbea, Nyl. 10 (Lydd Beach in fruit)

LECANOREI (continued)

- Squamaria *saxicola, Sm. 8 (Otford)
- Placodium callopismum, Mudd. 1, 8, 9, 10
- *decipiens, Leight. 2 (Eynsford), 8 (Borough Green, Sevenoaks)
- murorum, Leight. 1, 6, 8, 10 (Sandgate)
- *teicholytum, Cromb. 8 (Maidstone)
- Candelaria *laciniosa, Nyl. 2 (Shoreham), 8 (Brasted, Tunbridge Wells)
- vitellina, Cromb. 8, 10
 - sub-sp. xanthostigma, Nyl. 9
- Lecanora citrina, Ach. 1, 3, 8
 - albella, Nyl. 1, 8
 - allophana, Nyl. 1, 6, 8
 - atra, Ach. 1, 3, 8, 10
- *atro-flava, Nyl. 10 (Lydd Beach)
- aurantiaca, Nyl. 1, 2, 10
- calcarea, Somm. 8, 10
 - var. Hoffmanni, Somm. 8
- cerina, Ach. 2, 5, 8, 10
- *coccinea, Cromb. 8 (Penshurst Park)
- coilocarpa, Nyl. 8
- conizæa, Nyl. 8
- exigua, Nyl. 2, 6
- expallens, Ach. 3, 8, 9
 - var. lutescens, Nyl. 10
- galactina, Ach. 8, 10
- *gibbosa, Nyl. 10 (Lydd Beach)
 - var. zonata, 10 (Lydd Beach)
- *glaucoma, Ach. 10 (Folkestone)
- intumescens, Kærb. 8
- irrubata, Nyl. 8
 - sub-sp. calva, Nyl. 10
- *luteoalba, Nyl. 2 (Eynsford)
- pallescens, Nyl. 2, 8
- parella, Ach. 8
 - var. Turneri, Nyl. 2
- Parisiensis, Nyl. 1, 9
- pruinosa, Nyl. 8
 - f. nuda, Nyl. 9
- rugosa, Nyl.
 - sub-sp. chlorona, Nyl. 8
- subfusca, Nyl. 1, 6, 8
- *sulphurea, Ach. 3 (Canterbury), 9 (Charing)
- symmicta, Ach. 2
- *tartarea, Ach. 8 (Rusthall Common, Ightham)
- *urbana, Nyl. 10 (Folkestone)
- varia, Ach. 2, 8

LECANOREI (continued)

- Pertusaria amara, Nyl. 1, 8, 9, 10
- communis, D. C. 1, 8, 9
- *dealbata, Nyl. 8 (Rusthall Common)
- globulifera, Nyl. 2, 8, 9
- leioplaca, Schaer. 5, 6, 8
- lutescens, Lamy. 8
- *multipunctata, Nyl. 3 (Canterbury)
- *velata, Nyl. 6 (Wye), 8 (Ightham, Sevenoaks)
 - f. aspergilla, Cromb. 8 (Sevenoaks), 10 (Hythe)
- Wulfenii, D. C. 1, 6, 8, 9
 - *f. carnea, Fr. 3 (Canterbury), 8 (Toy's Hill),
- Phlyctis agelæa, Kærb. 8, 10
- argena, Kærb. 3, 9, 10 (Hythe, in fruit)
- Thelotrema *lepadinum, Ach. 8 (Ightham)
- Urceolaria scruposa, Ach. 1, 8
- Lecidea *abietina, Ach. 8 (Sevenoaks, Tunbridge Wells)
- alboatra, Hoffm. 2, 8
 - var. epipolia, Ach. 5, 8
- *arceutina, Arn. 8 (Maidstone)
- aromatica, Sm. 8 (Ightham, Barming)
- calcivora, Ehrh. 1, 10
- canescens, Dicks. 1, 7, 8, 10 (Broome Park and Hythe, in fruit)
- Caradocensis, Leight. 8 (Sevenoaks, Westerham)
- coarctata, Sm.
 - var. glebulosa, Leight. 8
- concentrica, Dav. 8
- contigua, Fr. 8
- *cyrtella, Ach. 5 (Sibertswood), 10 (Newington)
- decolorans, Flk. 1, 8
 - var. aporetica, Kærb. 1
- *denigrata, Fr. 8 (Tunbridge Wells)
- *disciformis, Fr. 8 (Sevenoaks)
- *dubia, Borrer. 8 (Otford)
- effusa, var. fuscella, Fr. 5, 8
 - var. cæcio-pruinosa, Mudd. 5, 10
- *endoleuca, Nyl. 8 (Dunk's Green)
- incompta, Borr. 8
- lucida, Ach. 8
- melæna, Nyl. 2, 8
- milliaria, Fr. 8
- myriocarpa, D. C. 2, 3, 8, 10
- *nigritula, Nyl. 8 (Toy's Hill), 1 (Hythe)

BOTANY

LECANOREI (continued)

- Lecidea ostreata, Hoffm. 1, 8
- parasema, Ach.
- var. elæochroma, Ach. 8
- *pelidna, Ach. 8 (*Sundridge*)
- petræa, Wulf.
- var. cinerea 10 (*Lydd Beach*)
- *premnea, Ach. 8
- (*Cobham, Penshurst*)
- quernea, Dicks. 1, 6, 8
- *rivulosa, Ach. 8 (*Ightham*)
- *rosella, Pers. 2 (*Chelsfield*)
- rubella, Ehrh. 2, 3, 8
- sabuletorum, Flk. 8
- *sphaeroides, Sommf. 8
- (*Toy's Hill*)
- *spododes, Nyl. 2 (*Cobham*)
- tricolor, With. 1, 2, 10
- uliginosa, Schrad. 2, 3, 8

LECANOREI (continued)

- Lecidea vesicularis, Hoffm. 5, 10
- GRAPHIDIEI
- Arthonia astroidea, Ach. 8
- cinnabarina, Wallr. 8
- var. anerythraea, Nyl. 3
- *proximella, Nyl. 5
- (*Sibertswood*)
- Graphis elegans, Sm. 3, 8
- scripta, Ach. 6, 8
- var. serpentina, Ach. 8
- Opegrapha atra, Pers. 8
- herpetica, Ach. 6, 8
- *lyncea, Sm. 8 (*Penshurst, Cobham*)
- saxicola, Ach. var. gyrocarpa, Zw. 8
- var. Persoonii, Ach. 8
- varia, Pers. f. notha, Ach. 2, 8
- f. pulicaris, Lightf. 6, 8

GRAPHIDIEI (continued)

- Opegrapha viridis, Pers. 2, 8, 10
- Stigmatidium crassum, Dub. 1, 3, 8
- PYRENOCARPEI
- Normandina lætevirens, Turn. and Borr. 8 (*Hungersball Rocks*)
- Verrucaria conoidea Fr. 10
- (*Hythe*)
- fuscilla, Turn. 8
- gemmata, Ach. 7, 8
- glaucina, Ach. 1, 8
- *macrostoma, Duf. 10
- (*Hythe*)
- nigrescens, Pers. 8, 10
- nitida, Weig.
- var. nitidella, Flk. 9
- olivacea, Borr. 5, 8
- rupestris, Schrad.
- var. muralis, Ach. 10

FUNGI.

The county of Kent is comparatively rich in fungi, due partly to the large extent of coppice wood laid down for hop poles, partly to the numerous pine woods in the county, and partly to the number of old trees in many of the parks. The records here given are taken from Foster's *Flora Tunbridgensis*, 1816; Berkeley, in *English Flora*, vol. v, pt. ii., 1836; Jenner, *Flora of Tunbridge Wells*, 1845; Hussey, *Illustrations of British Mycology*, 1847; Berkeley, *Outlines of British Mycology*, 1860; Cooke, *Handbook of British Fungi*, 1871; W.T.T., List of Fungi found near Tunbridge, *Gardener's Chronicle*, 1875; Worthington G. Smith, Drawings in the British Museum, and Berkeley and Broome, in various volumes of the *Annals of Natural History*; and M. C. Cooke and G. Massee in *Grevillea*, vols. xv.-xviii. The species scattered throughout these publications together with an extensive manuscript list compiled by Mr. E. M. Holmes of Sevenoaks, were brought together in a list published in the *Journal of Botany* for 1881 by Mr. Thos. Howse. Since that date numerous other species have been detected in the county, so that the list now given is a fairly complete one of the fungus flora of Kent, so far as it has been investigated.

It will be noted, however, from the localities given, that many parts of the county have not been thoroughly explored.

The records for Sydenham are almost entirely those noted by Mr. Howse as well as many of those from Kemsing, Shoreham, Chislehurst, and Deal. The species from Tunbridge Wells were, many of them, detected by the late Mr. Thos. Walker, F.L.S., and those from Southborough by Mr. W. Fawcett, B.Sc.; those from the neighbourhood of Greenwich by the late Mr. F. Currey, F.L.S., who published a list in the *Report of the Botanical Committee of the Greenwich Natural History Club* for December 3, 1857, those from the neighbourhood of Goudhurst by Mr. A. S. Bicknell and the Right Hon. Lord Justice Stirling, and those from the neighbourhood of Sevenoaks, Wrotham, Canterbury, Plumstead, Dover, and various other parts of the county by Mr. E. M. Holmes, F.L.S.

Fuller details concerning localities, than can be given in this list, may be found in the *Journal of Botany*, 1879, since the object here is to indicate the distribution of species in the different sections of the county as indicated in the Flora of Kent.

HYMENOMYCETES

AGARICINI

- Amanita aspera, Fr. Near Bromley
- excelsa, Fr. *Shorne Wood*
- mappa, Batsch. *Sevenoaks, Sandwich*
- muscari, L. *Sydenham*
- pantherina, D. C. *Chislehurst*

AGARICINI (continued)

- Amanita phalloides, Fr. *Bexley, Bostall Wood, Chislehurst, Witley*
- rubescens, Fr. In woods, *Sydenham*
- Amanitopus vaginata, Roze. Common
- Lepiota procera, Scop. *Sydenham, Tonbridge, Deal*

AGARICINI (continued)

- var. rhacodes, Vitt. *Sydenham*
- Lepiota acutesquamosa, Weinm. *Tunbridge Wells*
- amianthina, Scop. *Sevenoaks*
- clypeolaria, Bull. *Deal, Canterbury*
- cristata, A. & S. *Sydenham*

A HISTORY OF KENT

AGARICINI (continued)

- Lepiota erminea*. Fr. *Seal Park*
 — *Friesii*, Zsch. *Tunbridge Wells*
 — *granulosa*, Batsch. *Sydenham, Tunbridge Wells*
 — *holosericea*, C. R. *Staplehurst*
 — *meleagris*, Sow. On hot-beds
 — *naucina*, Fr. *Tunbridge Wells, Hasokhurst*
Armillaria mucida, Schrad. *Sevenoaks, Goudhurst*
Tricholoma album, Schæff. *Orpington*
 — *albo-brunneum*, Pers. *Sydenham, Tunbridge Wells*
 — *cinerascens*, Bull. *Sydenham*
 — *columbetta*, Fr. *Chislehurst, Bromley*
 — *cuneifolium*, Fr. *Crystal Palace, Tunbridge Wells*
 — *flavo-brunneum*, Fr. *Sydenham, Chislehurst, Tunbridge*
 — *grammopodium*, Bull. *Sydenham, Shoreham, Otford, Bromley*
 — *imbricatum*, Fr. *Bromley, Goudhurst*
 — *lascivum*, Fr. *Canterbury*
 — *melaleucum*, Pers. *Sydenham*
 — *nictitans*, Fr. *Shoreham, Hayes*
 — *nudum*, Bull. *Chislehurst, Tunbridge Wells, Bromley, Borough Green*
 — *personatum*, Fr. *Bromley, Lydd, Borough Green*
 — *rutilans*, Schæff. *Sydenham*
 — *saponaceum*, Fr. *Chislehurst, Shoreham, Sevenoaks, Goudhurst, Tunbridge Wells*
 — *sejunctum*, Somm. *Tunbridge Wells*
 — *subpulverulentum*, Pers. *Sydenham, Sandwich, Deal*
 — *sulphureum*, Fr. *Chislehurst, Tunbridge Wells*
 — *vaccinum*, Fr. *Bexley*
Clitocybe candicans, Pers. *Sydenham, Hadlow*
 — *brumalis*, Fr. *Sydenham, Canterbury*
 — *cyathiformis*, Bull. *Shoreham, Bromley, Tunbridge Wells*
 — *dealbata*, Sow. *Bromley*
 — *flaccida*, Sow. *Sydenham, Chislehurst, Goudhurst*

AGARICINI (continued)

- Clitocybe fragrans*, Sow. *Sandwich, Deal, near Frith Wood, Bromley, Shoreham, Bessell's Green*
 — *geotropæa*, Bull. *Tunbridge Wells*
 — *maximus*. Alb. and Schu. *Sevenoaks*
 — *gilva*, Pers. *West Farleigh*
 — *metachrous*, Fr. *Sydenham*
 — *platyphylla*, Fr. *Sydenham*
 — *radicata*, Relh. *Sydenham, Tunbridge Wells, Wrotham, Sevenoaks*
Collybia cirrhata, Schum. *Sydenham*
 — *inornata*, Sow. *Tunbridge Wells*
 — *maculata*, Alb. and Schu. var. *immaculata*. *Knole Park*
 — *nebularis*, Batsch. *Sydenham*
 — *odora*, Sow. *Bromley, Sevenoaks*
 — *phyllophila*, Fr. *Orpington, Cobham*
Laccaria bella, B. & Br.
Mycena alcalina, Fr. *Sydenham, Bostall Wood, Shoreham, Cobham, Bromley, Starvecrow Wood*
 — *capillaris*, Fr. *Shoreham, Darent Wood*
 — *citrinella*, Pers. *Otford*
 — *collariata*, Fr. *Addington*
 — *corticola*, Fr. *Shortlands, Sevenoaks*
 — *debilis*, Fr. *Wrotham*
 — *elegans*, Pers. *Canterbury, Bromley*
 — *epipterygia*, Scop. *Sydenham*
 — *filipes*, Bull. *Sydenham*
 — *flavo-alba*, Fr. *Shoreham, Crystal Palace*
 — *galericulata*, Scop. *Sydenham, Knole Park*
 — *galopoda*, Fr. *Sydenham*
 — *lactea*, Pers. *Otford, Chislehurst, Bromley, Margate, Canterbury*
 — *leptocephala*, Pers. *Knole Park*
 — *metata*, Fr. *Wrotham*
 — *polygramma*, Bull. *Sydenham*
 — *psammicola*, B. & Br. *Addington*
 — *pterigena*, Fr. *Canterbury*
 — *pura*, Pers. *Common*
 — *rosella*, Fr. *Shoreham*
 — *saccharifera*, B. & Br. *Lower Sydenham*

AGARICINI (continued)

- Mycena sanguinolenta*, A. & S. *Sydenham, Sevenoaks, Canterbury*
 — *tenerima*, Berk. *Sevenoaks, Otford*
 — *vitis*, Fr. *Sydenham*
 — *vulgaris*, Pers. *Sydenham*
Omphalia camptophylla, Berk. *Margate*
 — *directa*, B. & Br. *Chislehurst*
 — *fibula*, Bull. *Sydenham* var. *Swartzii*, Fr. *Sydenham, Crystal Palace*
 — *muralis*, Sow. *Ightham, Tunbridge Wells*
 — *pyxidata*, Bull. *Dunton Green, Tunbridge Wells*
 — *umbellifera*, Lin. *Ightham, Sydenham, Canterbury, Starvecrow Wood*
Pleurotus algidus, Fr. *Sydenham*
 — *circinnatus*, Fr. *Staplehurst*
 — *corticatus*, Fr. *Staplehurst*
 — *dryinus*, Pers. *Hayes*
 — *hypnophilus*, Berk. *Bexley, Sevenoaks*
 — *lignatilis*, Fr. *Knole Park*
 — *ostreatus*, Jacq. *Sydenham, Bromley, Hayes, Polehill* var. *euosmus*, Cke. *Hayes, West Wickham*
 — *tremulus*, Cr. *Langton Green*
 — *ulmarius*, Bull. *Beckenham*
Volvaria bombycina, Fr. *Bromley*
 — *Taylori*, Berk. *Sandwich*
 — *volvacea*, Bull. *Bromley*
Pluteus cervinus, Schæff. *Sydenham, Chislehurst, Sevenoaks*
 — *chrysophæus*, Schæff. *Shoreham, Otford*
Entoloma clypeatum, Linn. *Sydenham*
 — *costatum*, Fr. *Maidstone*
 — *juba tum*, Fr. *Knole Park*
 — *nidosum*, Fr. *Knole Park, Tunbridge Wells*
 — *rhodopolium*, Fr. *Sydenham, Chislehurst, Darent Wood*
 — *sericeum*, Fr. *Sydenham, Sevenoaks*
 — *Thomsoni*, Berk. & Br. *West Farleigh*
Clitopilus orcella, Bull. *Sydenham*
 — *prunulus*, Scop. *Bromley*
Leptonia incana, Fr. *Crayford*

BOTANY

AGARICINI (continued)

- Nolanea pascua*, Pers. *Sydenham*
 — *picea*, Kalchbr. *Oxford*
Pholiota adiposa, Fr. *Sevenoaks*
 — *caperata*, Pers. *Bromley*
 — *dura*, Bolt. *Sydenham*
 — *heteroclita*, Fr. *Bromley*
 — *marginata*, Batsch. *Shoreham*
 — *mutabilis*, Schæff. *Sydenham*
 — *præcox*, Pers. *Sydenham, Knole Park, Pembury*
 — *pudica*, Fr. *Canterbury*
 — *radiciosa*, Bull. *Oxford*
 — *spectabilis*, Fr. *Between Shoreham and Duntun Green, Chislehurst*
 — *squarrosa*, Mull. *Knole Park, Chislehurst, Cobham, Bromley*
 — *terrigena*, Fr.
 f. minor, *West Farleigh*
Inocybe fastigiata, Schæff. *Starvecrow Wood*
 — *flocculosa*, Berk. *Bromley*
 — *geophylla*, Fr. *Bromley*
 — *lacera*, Fr. *Sydenham*
 — *pyriodora*, Pers. *Canterbury, Langton Green*
 — *rimosa*, Bull. *Sevenoaks, Shoreham, Bromley, Sand*
 — *scaber*, Fr. *Oxford*
 — *sindonia*, Fr. *Tunbridge Wells*
 — *trechispora*, Berk. *Sydenham*
Hebeloma crustuliniforme, Bull. *Sydenham, Shoreham, Oxford*
 — *elatum*, Fr. *Buckland*
 — *fastibile*, Fr. *Sydenham, Tonbridge, Bromley, Sandwich*
Flammula carbonaria, Fr. *Tunbridge Wells*
 — *flavida*, Schæff. *Sydenham*
 — *lubrica*, Fr. *Tunbridge Wells*
 — *sapinea*, Fr. *Bostall Wood*
Naucoria cucumis, Pers. *Sevenoaks*
 — *melanoides*, Fr. *Sydenham*
 — *pediades*, Fr. *Sydenham*
 — *semiorbicularis*, Bull. *Brasted, Sevenoaks*
 — *vervacti*, Fr. *Bromley*
Galera hypnorum, Batsch. *Sydenham*
 — *lateritia*, Fr. *Bromley*
 — *ovalis*, Fr. *Sydenham*
 — *tenera*, Schæff. *Bromley, Sevenoaks, Deal*

AGARICINI (continued)

- Tubaria furfuracea*, Pers. *Sydenham*
Crepidotus alveolus, Lasch. *Tunbridge Wells*
 — *mollis*, Fr. *Sevenoaks, Shoreham*
 — *rubi*, Berk. *Margate, Tunbridge Wells*
Claudopus variabilis, P. *Halstead, Oxford, Sydenham, Speldhurst*
Psalliota arvensis, Schæff. *Sydenham, Tunbridge Wells, Chislehurst*
 — *campestris*, L. *Sydenham*
 var. silvicola, *Sydenham*
Stropharia æruginosa, Curr. *Sydenham*
 — *semiglobata*, Batsch. *Sydenham, Bromley, Ide Hill*
 — *squamosa*, Fr. *Knole Park, Tunbridge Wells, Sevenoaks*
Hypholoma appendiculatum, Fr. *Sydenham*
 — *candolleianum*, Fr. *St. Paul's Cray, Chislehurst*
 — *epixanthum*, Fr. *Oxford*
 — *fasciculare*, Huds. *Sydenham*
 — *hydrophilum*, Bull. *Dover*
 — *lacrymabundum*, Fr. *Cristal Palace*
 — *sublateritium*, Fr. *Crystal Palace*
Psilocybe comptula, Berk. *Crofton Woods*
 — *fœnisecii*, Fr. *Sandwich*
 — *nuciseda*, Fr. *West Farleigh*
 — *semilanceata*, Fr. *Dartford Heath, Knole Park*
 — *spadicea*, Schæff. *Sydenham*
 — *stercoraria*, Schum. *Cobham*
Psathyra corrugis, P. *Sydenham*
 — *fibrillosa*, Pers. *Tunbridge Wells*
 — *spadiceo-grisea*, Schæff. *Sydenham*
Panæolus campanulatus, Linn. *Sydenham, Sevenoaks*
 — *fimiputris*, Bull. *Sydenham, Sevenoaks, Bromley*
 — *papilionaceus*, Bull. *Tunbridge, Sandwich*
 — *separatus*, Linn. *Sydenham*
Psathyrella atomata, Fr. *Crystal Palace, Bromley, Margate*
 — *disseminata*, P. *Duntun Green, Bromley*
 — *gracilis*, Fr. *Bromley*

AGARICINI (continued)

- Coprinus atramentarius*, Fr. *Sydenham, Chislehurst, Shortlands*
 — *comatus*, Fr. *Crystal Palace, Chislehurst, Bromley, Beckenham*
 — *ephemerus*, Fr. *Sydenham*
 — *extinctorius*, Fr. *Kemsing*
 — *micaceus*, Fr. *Sydenham, Bromley, Wrotham, Cobham, Sandwich*
 — *niveus*, Fr. *Deal, Bromley*
 — *plicatilis*, Fr. *Sydenham, Bromley, Sevenoaks, Hadlow, Tunbridge Wells, Wrotham*
 — *radiatus*, Fr. *Sydenham*
Bolbitius apicalis, Smith. *Staplehurst*
 — *tener*, Berk. *Sydenham*
 — *titubans*, Fr. *Bromley*

CORTINARIUS

- (*Phlegmacium*) *cyanopus*, Fr. *Sevenoaks*
 — *fulgens*, Fr. *Oxford, Wrotham*
 — *glaucopus*, Fr. *Wickham, Bromley*
 — *triumphans*, Fr. *Sevenoaks*
 (*Myxaciium*) *collinitus*, Fr. *Bromley, Tunbridge Wells*
 — *elator*, Fr. *Sydenham, Bexley, Chislehurst, Tunbridge Wells, Borough Green*
 (*Inoloma*) *bolaris*, Fr. *Shoreham*
 — *sublanatus*, Fr. *Sydenham, Holwood*
 — *violaceus*, Fr. *Sevenoaks, Goudhurst, Bromley*
 (*Dermocybe anomalus*) Fr. *Sydenham, Shoreham*
 — *caninus*, Fr. *Chislehurst, Shoreham, Tunbridge Wells*
 — *cinnamomeus*, Fr. *Bostall Wood, Chislehurst, Sandwich, Keston*
 — *sanguineus*, Fr. *Bromley, Goudhurst*
 (*Telamonia*) *armillatus*, Fr. *Chislehurst, Bromley*
 — *gentilis*, Fr. *Canterbury, Bromley*
 — *iliopodius*, Fr. *Canterbury, Bromley*
 — *hemitrichus*, Fr. *Sydenham*
 (*Hygrocybe*) *castaneus*, Fr. *Sydenham, Canterbury, Tunbridge Wells*
 — *imbutus*, Fr. *Sydenham*
 — *leucopus*, Fr. *Sydenham*

A HISTORY OF KENT

CORTINARIUS (continued)

- Hygrocype milvinus, Fr. *Wrotham*
 — Reedii, Berk. *Hayes*
 Paxillus atro-tomentosus, Fr. *Sydenham*
 — crassus, Fr. *Blackheath*
 — involutus, Fr. *Sydenham*
 — leptopus, Fr. *Sydenham*
 — pannoides, Fr. *Charlton*
 — paradoxus, Kalch. *Wrotham*
 Gomphidius glutinosus, Fr. *Sandwich, Bromley, Tunbridge Wells*
 — gracilis, Berk. & Br. *Tunbridge Wells*
 — viscidus, Fr. *Goudhurst*
 Hygrophorus arbustivus, Fr. *Shoreham, Wrotham*
 — calyptraformis, Berk. *Sevenoaks*
 — ceraceus, Fr. *Sydenham, Sevenoaks*
 — coccineus, Fr. *Chislehurst, Cobham Park, Bromley*
 — conicus, Fr. *Sydenham, Orpington, Shoreham, Sandwich*
 — cossus, Fr. *Tunbridge Wells, Bromley*
 — discoideus, Fr. *Shoreham, Kemsing*
 — eburneus, Fr. *Chislehurst, Dunton Green, Shoreham, Borough Green, Bromley*
 — hypothecus, Fr. *Sydenham, Plumstead, Bromley, Shoreham*
 — leporinus, Fr. *Kent*
 — milvinus, Fr. *Wrotham*
 — miniatus, Fr. *Sydenham, Chislehurst, Tunbridge Wells*
 — niveus, Fr. *Crystal Palace, Seal*
 — pratensis, Fr. *Tunbridge Wells, Tonbridge, Bromley, Sevenoaks*
 — psittacinus, Fr. *Crystal Palace, Deal, Cobham, Sevenoaks, Tunbridge Wells*
 — puniceus, Fr. *Sevenoaks, Tunbridge Wells*
 — russo-coriaceus, Berk. & Mill. *Tunbridge Wells, Deal*
 — unguinosus, Fr. *Sydenham*
 — virgineus, Wulf. *Sevenoaks*
 Lactarius blennius, Fr. *Sydenham, Tonbridge*
 — chrysorrhæus, Fr. *Plumstead, Goudhurst*
 deliciosus, Fr. *Sydenham, Sandwich, Bexley, Shoreham, Tunbridge Wells*

CORTINARIUS (continued)

- Lactarius fuliginosus, Fr. *Near Bromley*
 — glyciosmus, Fr. *Sydenham, Chislehurst*
 — mitissimus, Fr. *Otford, Sevenoaks*
 — piperatus, Fr. *Wrotham, Southborough, Hadlow, Bromley*
 — plumbeus, Fr. *Tunbridge Wells*
 — quietus, Fr. *Sydenham, Sevenoaks, Bromley*
 — rufus, Fr. *Sydenham, Chislehurst, Keston, Sevenoaks*
 — seriffus, Fr. *Sydenham, Bromley, Hayes*
 — subdulcis, Fr. *Sydenham, Orpington, Bexley, Sevenoaks, Brasted*
 — torminosus, Fr. *Sandwich, Bromley, Tunbridge Wells*
 — turpis, Fr. *Sydenham*
 — uvidus, Fr. *Hadlow*
 — vellereus, Fr. *Bexley, Sevenoaks*
 — volemus, Fr. *Sevenoaks, Maidstone, Hayes*
 Russula adusta, Fr. *Chislehurst, Bromley, Goudhurst*
 — alutacea, Fr. *Sandwich, Bromley, Goudhurst*
 — cyanoxantha, Fr. *Sydenham, Chislehurst, Sevenoaks*
 — decolorans, Fr. *Borough Green*
 — depallens, Fr. *Seal*
 — emetica, Fr. *Chislehurst, Bexley, Bromley, Sevenoaks, Borough Green*
 — foetens, Fr. *Sydenham, Sevenoaks, Wrotham*
 — fragilis, Fr. *Sydenham, Bexley, Chislehurst, Wrotham, Sevenoaks, Tonbridge*
 — furcata, Fr. *Orpington*
 — heterophylla, Fr. *Sydenham, Joyden's Wood, Bostall Wood, Chislehurst, Wrotham, Sevenoaks*
 — integra, Fr. *Sydenham, Seal*
 — lepida, Fr. *Hayes, Dunton Green*
 — nigricans, Fr. *Sevenoaks, Chislehurst, Wrotham*
 — ochroleuca, Fr. *Sevenoaks, Chislehurst*
 — rosacea, Fr. *Chislehurst, Sevenoaks*
 — vesca, Fr. *Sevenoaks, Chislehurst*

CORTINARIUS (continued)

- Cantharellus aurantiacus, Fr. *Sydenham, Plumstead, Sevenoaks*
 — cibarius, Fr. *Plumstead, Sevenoaks*
 — cupulatus, Fr. *Goudhurst*
 Nyctalis asterophora, Fr. *Chislehurst*
 — parasitica, Fr. *Chislehurst, Tunbridge Wells*
 Marasmius androsaceus, Fr. *Sydenham, Chislehurst, Lewisham, Bromley*
 — epiphyllus, Fr. *Sydenham, Chislehurst, Bromley*
 — erythropus, Fr. *Sydenham, Tunbridge Wells, Bexley, Hadlow, Cobham*
 — foetidus, Fr. *Otford, Sevenoaks*
 — insitius, Fr. *Deal*
 — oreades, Fr. *Sydenham, Plumstead, Wrotham, Deal*
 — peronatus, Fr. *Wrotham, Shoreham, Dunton Green, Sevenoaks, Bromley*
 — porreus, Fr. *Shoreham*
 — ramealis, Fr. *Shoreham*
 — rotula, Fr. *Plumstead, Sevenoaks, Bromley*
 — saccharinus, Fr. *East Farleigh*
 — terginus, Fr. *Goudhurst*
 — urens, Fr. *Sydenham*
 Lentinus cochleatus, Fr. *Knole Park*
 — lepideus, Fr. *Dartford*
 — tigrinus, Fr. *Southborough*
 — vulpinus, Fr. *Margate*
 Panus conchatus, Fr. *Sevenoaks, Margate*
 — stypticus, Fr. *Sydenham, Shooter's Hill, Sevenoaks, Wrotham, Shoreham, Goudhurst*
 — torulosus, Fr. *Dunton Green, Sevenoaks*
 Lenzites betulina, Fr. *Shooter's Hill, Sevenoaks, Wrotham*
 — flaccida, Fr. *Sydenham, Sevenoaks*
 Schizophyllum commune, Fr. *Kent*

POLYPOREI

- Boletus æstivalis, Fr. *Staplehurst*
 — alutarius, Fr. *Kent*
 — badius, Fr. *Plumstead, Chislehurst, Sevenoaks*
 — bovinus, L. *Goudhurst, Sandwich*
 — calopus, Fr. *Sevenoaks*
 — castaneus, Bull. *Hayes*

BOTANY

POLYPOREI (continued)

- Boletus chrysenteron*, Fr. Sydenham, Sevenoaks, Chislehurst, Bexley, Plumstead
- *cyanescens*, Bull. Staplehurst
- *edulis*, Bull. Sydenham, Sevenoaks, Shoreham, Bexley, Goudhurst
- *elegans*, Schum. Goudhurst
- *felleus*, Bull. Chislehurst, Sevenoaks
- *flavus*, With. Crystal Palace, Bexley, Tunbridge Wells
- *granulatus*, L. Tunbridge Wells, Goudhurst, Keston
- *laricinus*, B. Shoreham, Sevenoaks, Keston
- *luridus*, Fr. Sydenham, Langton Green, Pickhurst, Goudhurst
- *luteus*, L. Sydenham, Wrotham, Shoreham, Otford, Kemsing
- *pachypus*, Fr. Sevenoaks, Dunton Green, Goudhurst
var. *amarus*, Fr. Bromley
- *piperatus*, Bull. Sydenham, Sevenoaks, Chislehurst
- *purpureus*, Fr. Staplehurst
- *rubinus*, Smith. Bexley
- *sanguineus*, With. Staplehurst
- *Satanas*, Lenz. Goudhurst
- *scaber*, Fr. Sydenham, Sevenoaks, Bexley, Chislehurst
- *subtomentosus*, L. Bexley, Chislehurst, Sevenoaks, Goudhurst
var. *radicans*, Kromb. Staplehurst
- *variegatus*, Fr. Goudhurst, Tunbridge Wells, Sevenoaks
- *versipellis*, Fr. St. Mary Cray, Goudhurst
- *viscidus*, Linn. Staplehurst
- Strobilomyces strobilaceus*, Berk. Sevenoaks
- Polystichus abietinus*, Fr. Kemsing, Sevenoaks, Stone Street
- *hirsutus*, Fr. Goudhurst
- *perennis*, Fr. Bexley, Tunbridge Wells, Sevenoaks
- *velutinus*, Fr. Tunbridge Wells
- Polyporus adustus*, Fr. Sevenoaks
- *betulinus*, Fr. St. Mary Cray, Sevenoaks

POLYPOREI (continued)

- Polyporus chioneus*, Fr. Dunton Green, Sandwich
- *crispus*, Fr. Sydenham
- *destructor*, Fr. Otford
- *dryadeus*, Fr. Eynsford, Sevenoaks, Hayes, Cobham
- *fumosus*, Fr. Sydenham, Otford
- *giganteus*, Fr. Kemsing
- *Herbergii*, Rost. Kent (Currey in *Grevillea*, viii. 5)
- *hybridus*, Berk. & Br. Tunbridge Wells
- *intybaceus*, Fr. Chislehurst, Shoreham, Tunbridge Wells, Beckenham
- *quercinus*, Fr. Hayes, Sevenoaks
- *rufescens*, Fr. Sydenham
- *Schweintzii*, Fr. Goudhurst
- *sulfureus*, Fr. Kemsing
- Fomes annosus*, Fr. Plumstead, Sydenham, Dunton Green
- *conchatus*, Fr. Shortlands
- *ferrugineus*, Fr. Chislehurst
- *igniarius*, Fr. Beckenham, Farningham
- *ribis*, Fr. Sydenham, Sevenoaks
- *salicinus*, Fr. Shortlands, Seal
- *ulmarius*, Fr. Lewisham, Chislehurst
- Poria mollusca*, Fr. Sydenham, St. Mary Cray, Otford
- *umbrina*, Fr. Sevenoaks
- *vaporaria*, Fr. Chislehurst, Bexley, Sevenoaks, Wrotham
- *vulgaris*, Fr. Sevenoaks
- Trametes gibbosa*, Fr. Kemsing, Hayes Common
- Dædalea unicolor*, Fr. Sydenham, Ightham, Dunton Green, Tunbridge Wells
- *quercina*, Pers. Sydenham
- Merulius corium*, Fr. Sibertswood, Sevenoaks
- *serpens*, Fr. Sydenham
- *tremellosus*, Schrad. Kemsing, Hayes Common
- Fistulina hepatica*, Fr. Chislehurst, Sevenoaks, Barming, West Wickham

HYDNEI

- Hydnum auriscalpium*, L. Sydenham, Shoreham, Ightham
- *farinaceum*, P. Sydenham
- *graveolens*, Del. Southborough

HYDNEI (continued)

- Hydnum imbricatum*, L. Near Maidstone, Seal, Chart
- *nigrum*, Fr. Otford, Shoreham
- *repandum*, L. Sydenham
- *udum*, Fr. Margate
- Sistotrema confluens*, P. Tunbridge Wells
- Phlebia merismoides*, Fr. Hayes Rectory
- AURICULARINI
- Craterellus cornucopoides*, Fr. Joyden's Wood, Halstead, Borough Green
- *sinuosus*, Fr. Joyden's Wood
- Thelephora caryophyllea*, Fr. Southborough
- *laciniata*, P. Ightham, Chislehurst, Canterbury
- *fastidiosa*, Fr. Darent Wood
- Soppitiella sebacea*, Fr. Joyden's Wood, Bostall Wood, Tunbridge Wells
- Stereum hirsutum*, Fr. Sydenham
- *ochroleucum*, Fr. Brasted, Westenbanger
- *purpureum*, Fr. Sydenham
- *rugosum*, Fr. Sydenham, Brasted, Chart, Tunbridge Wells
- *sanguinolentum*, Fr. Ightham Toy's Hill, Dunton Green
- *spadiceum*, Fr. Dunton Green, Borough Green
- *rubiginosum*, Lev. Sydenham, Sevenoaks
- Auricularia mesenterica*, Bull. Farningham, Seal, Maidstone, Dove's, Erith
- Cyphella capula*, Fr. Darent Wood
- Corticium arachnoideum*, Berk. St. Mary Cray
- *Carlylei*, Mass. Borough Green
- *comedens*, Fr. St. Mary Cray
- *cæruleum*, Fr. Speldhurst
- *læve*, Br. Sydenham, St. Mary Cray, Maidstone, Erith
- *nigrescens*, Fr. Sydenham
- *nudum*, Fr. Sydenham, Margate
- *Sambuci*, P. Tunbridge Wells, St. Mary Cray
- Peniophora cinerea*, Fr. Sydenham
- *gigantea*, Fr. Sydenham
- *incarnata*, Fr. Chislehurst

A HISTORY OF KENT

AURICULARINI (continued)

- Peniophora pubera, Fr. St. Mary Cray
— quercina, P. St. Mary Cray, Southborough

CLAVARIEI

- Clavaria aurea, Schæff. Tunbridge Wells
— ceranoides, P. Tunbridge Wells
— cinerea, Bull. Dunton Green
— condensata, Fr. West Farleigh
— coralloides, L. Sevenoaks
— cristata, Holmsk. Sydenham, Hythe, Halstead, Seal
— fastigiata, D. C. Shoreham, Tunbridge Wells, Seal
— fragilis, Holmsk. Seal Park
— fusiformis, Sow. Sydenham, Tunbridge Wells
— inæqualis, Mull. Sydenham, Tunbridge Wells
— pistillaris, L. Sevenoaks
— rugosa, Bull. Sydenham, Tunbridge Wells, Seal
— umbrina, Berk. Tunbridge Wells
— vermiculata, Scop. Sydenham, Southborough
Calocera viscosa, Fr. Wrotham, Shoreham
Sparassis crispa, Fr. Goudhurst, Tunbridge Wells
Pistillaria quisquiliaris, Fr. Darenth Wood, Kemsing

TREMELLINI

- Tremella foliacea, P. Sydenham, Halstead, Sevenoaks, Tunbridge Wells
— albida, Huds. Kemsing
— lutescens, Fr. Southborough
— mesenterica, Retz. Rochester, Otford, Postling, Southborough
— torta, Willd. St. Mary Cray
— viscosa, Pers. Sydenham
Exidia glandulosa, Fr. Erith, Southborough
Nematella nucleata Fr. Sydenham
Tremellodon gelatinosum, Pers. Seal, Chart
Dacrymyces chrysocomus, Tul. Tunbridge Wells
— deliquescens, Duby. Kemsing
— stellatus, Nees. Sydenham

GASTEROMYCETES

HYPOGÆI

- Hymenogaster luteus, Vitt. Greenwich

HYPOGÆI (continued)

- Melanogaster ambiguus, Vul. var. intermedius, Seal, Chart
Octaviania compacta, Tulasne. Otford

PHALLOIDEI

- Cynophallus caninus, Fr. Sydenham
Phallus impudicus, L. Sydenham, Bostall Wood, Langton Green, Westerham, Sevenoaks

TRICHOGASTRES

- Geaster coliformis, P. Bexley, East Wickham, Westwood near Southfleet, Plumstead
— fornicatus, Fr. Wickham, near Bromley
— Bryantii, Berk. Crockham Hill, Sevenoaks
— striatus, D. C. Sevenoaks
Tulostoma mammosum, Fr. Greenwich
Bovista nigrescens, P. Dartford
Lycoperdon cœlatum, Fr. Shoreham, Hayes
— gemmatum, Fr. Willesborough, Tunbridge Wells
— giganteum, Batsch. Crystal Palace, Sevenoaks
— pusillum, Fr. Deal
— pyriforme, Schæff. Shoreham, Wrotham, Swanscombe Wood, Joyden's Wood
— saccatum, Vahl. Abbey Wood, Keston
Scleroderma vulgare, Fr. Sydenham, St. Paul's Cray, Ightham, Tunbridge Wells

MYXOGASTRES

- Physarum cinereum, Batsch. Sydenham
— didermoides, Ach. Greenwich
— sinuosum, Bull. Darenth Wood
Tilmadoche nutans, Rostaf. Greenwich
Craterium leucocephalum, Pers. Southborough
— minutum, Leers. Tunbridge Wells
Leocarpus fragilis, Dicks. Tunbridge Wells
Fuligo varians, Sommf. Sydenham, Deal, Tunbridge Wells
Badhamia inaurata, Curr. Chislehurst
— utricularis, Bull. var. Schimperiana, Cooke. Sydenham

MYXOGASTRES (continued)

- Didymium microcarpon, Fr. Greenwich
— squamulosum, A. & S. Sydenham
Chondrioderma difforme, Pers. St. Mary Cray
— Michelli, Lib. Sydenham
— spumarioides, Fr. Greenwich
Spumaria alba, D. C. Sydenham, Darenth, Deal
Stemonitis ferruginea, Ehr. Sydenham
— fusca, Roth. Sydenham, Darenth, Tunbridge Wells
Comatricha Friesiana, De. By. var. obovata, De. By. Sydenham
var. oblongata, De. By. Sydenham, Tunbridge Wells
— typhina, Roth. Greenwich
Enerthenema papillata, Pers. Greenwich
LAMPROSPORÆ
Reticularia lycoperdon, Bull. Sydenham, Swanscombe, Dunton Green, Stone Street
Trichia chrysosperma, D. C. Sydenham, St. Mary Cray, Darenth Wood
— fallax, Pers. Kemsing, Tunbridge Wells
— turbinata, With. Darenth Wood, Tunbridge Wells
— varia, Pers. Shoreham
var. nigripes, Pers. Greenwich
Arcyria cinerea, Schum. Greenwich
— incarnata, Pers. Sydenham, Bostall Wood
— nutans, Fr. Dunton Green, Tunbridge Wells
— punicea, Pers. Sydenham, Shoreham, St. Mary Cray, Darenth, Tunbridge Wells
Lycogala epidendrum, Bux. Sydenham, Tunbridge Wells, Dunton Green
Perichæna depressa, Lib. Sydenham Hill
NIDULARIACEI
Cyathus striatus, Hoffm. Greenwich, Sevenoaks
— vernicosus, D. C. Tunbridge Wells, Sevenoaks
Crucibulum vulgare, Tul. Greenwich, Borough Green
Sphærobolus stellatus, Tode. Sydenham Hill

BOTANY

CONIOMYCETES

SPHÆRONEMEI

- Phoma Beckhausii, Cooke.
Dartford
 — Calystegiae, Cooke. *Darenth*
 — Candollei, B. & Br. *Swanscombe*
 — complanata, Pers. *Darenth*
 — depressua, B. & Br. *Tunbridge Wells*
 — Durandiana, Sacc & Roum. *Dartford*
 — errabunda, Desm. *Darenth*
 — exigua, Desm. *Tunbridge Wells*
 — glandicola, Desm. *Dartford*
 — glyptica, Cooke & Mass. *Tunbridge Wells*
 — herbarum, West. *Swanscombe*
 — lirella, Desm. *Swanscombe*
 — Mirbellii, Fr. *Kent*
 — nebulosua, Berk. *Tunbridge Wells, Sevenoaks*
 — petiolorum, Desm. *Dartford*
 — planiuscula, Sacc. *Swanscombe*
 — projecta, Cooke. *Swanscombe*
 — rhoina, Cooke. *Swanscombe*
 — samarorum, Desm. *Dartford*
 — scobina, Cooke. *Darenth*
 — subcomplanata, Cooke & Mass. *Tunbridge Wells*
 — tamariscella, Sacc. *Walmer*
 — vulgaris, Sacc. *Dartford*
 Leptothyrium Castaneæ, Spr. *Darenth*
 — medium, Cooke.
 var. Castaniæcola, Cooke.
 — litigiosum, Desm. *Darenth*
 — quercinum, Sacc. *Darenth*
 — Ribis, Sacc. *Darenth*
 Cryptosporium amygdalinum, *Darenth*
 — Neesii, Corda. *Blackheath*
 Acrospermum graminum, Lib. *Dartford*
 Diplodia Cratægi, West. *Kent*
 — herbarum, Lévl. *Darenth*
 — lantana, Fückl. *Darenth*
 — ligustri, West. *Darenth*
 — mutila, Fr. *Kent*
 — Sarcothamni, Cooke & Hk. *Swanscombe*
 — Tilizæ, Fückl. *Blackheath*
 Hendersonia Fiedleri, West. var. Symphoricarpi Cooke.
 — Robinizæ, West. *Swanscombe*

SPHÆRONEMEI (continued)

- Vermicularia dematium, Fr. *Darenth*
 — trichella, Grev. *Dartford*
 Septoria anemones, Desm. *Darenth*
 — Astragali, Desm. *Darenth*
 — castaniæcola, Desm. *Darenth*
 — Clematidis, Rob. *Dartford, Darenth, Swanscombe*
 — cornicola, Desm. *Darenth*
 — Epilobi, West. *Darenth*
 — Hederæ, Desm. *Dartford*
 — humilis, West. *Dartford*
 — lamiicola, Sacc. *Swanscombe*
 — Lavandulæ, Desm. *Swanscombe*
 — Lysimachizæ, West. *Darenth, Swanscombe*
 — Populi, Desm. *Swanscombe*
 — quercicola, Sacc. *Darenth*
 — scabiosæcola, Desm. *Tunbridge Wells*
 — Ulmi, Kze. *Greenwich*
 — Viburni, West. *Darenth*
 — Virgaureæ, Desm. *Darenth*
 Phyllosticta Aceris, Sacc. *Darenth*
 — Arbuti, Desm. *Swanscombe*
 — Berberidis, West. *Darenth*
 — cornicola, D. C. *Darenth*
 — destructiva, Desm. *Dartford*
 — Humuli, Sacc. & Sp. *Swanscombe*
 — Lauri, West. *Swanscombe*
 — Loniceræ, West. *Darenth*
 — maculiformis, Sacc. *Darenth*
 — Mahonizæ, Sacc. & Sp. *Swanscombe*
 — Medicaginis, Fückl. *Dartford*
 — Mercurialis, Desm. *Darenth*
 — Plantaginis, Sacc. *Swanscombe*
 — primulæcola, Desm. *Darenth*
 — ruscicola, Desm. *Swanscombe*
 — Vicizæ, Lib. *Sydenham*
 Cheilaria Arbuti, Desm. *Swanscombe*
 — Coryli, Rob. *Swanscombe*
 Prosthemium betulinum, Kze. *Blackheath*
 Asteroma Aceris, Rob. *Darenth*
 — Cratægi, Berk. *Tonbridge*
 — obscurum, Desm. *Dartford*
 — Ulmi, Kl. *Darenth*
 — carphospermum, Fr. *Blackheath*

SPHÆRONEMEI (continued)

- Cytispora foliicola, Lib. *Swanscombe*
 — leucosperma, Pers. *Tunbridge Wells*
 — rubescens, Fr. *Swanscombe*
 Melanconium bicolor, Nees. *Sydenham*
 — stilbostoma, Fr. *Blackheath*
 Cystopus candidus, Lévl. *Sevenoaks, Tunbridge Wells*
 — cubicus, Lk. *New Cross*
 — lepigoni, De Bay. *Northfleet*
 UREDINÆ
 Caeomma Mercurialis, Wint. *Darenth Wood*
 — Saxifragæ, Wint. *Greenwich*
 Coniothecium amentaceum, Corda. *Darenth Wood*
 Sporidesmium Lepraria, B. & Br. *Penshurst*
 Coleosporium Campanulæ, Lévl. *Darenth Wood*
 Endophyllum Euphorbiæ, D. C. *Darenth Wood*
 Gymnosporangium clavariæforme, Plowr. *Sydenham*
 Melampsora betulina, Desm. *Sydenham*
 — Cerastii, Schröt. *Greenwich*
 — Hypericorum, D. C. *Darenth Wood, Duntun Green*
 — Vitellinæ, D. C. *Greenwich*
 Æcidium Bunii, D. C. *Darenth*
 — Poterii, Cke. *Dartford*
 Phragmidium acuminatum, Fr. *Dartford*
 — bulbosum, Fr. *Greenwich*
 — gracile, Grev. *Greenwich*
 — obtusum, Link. *Greenwich*
 Puccinia Adoxæ, D. C. *Swanscombe Wood*
 — albescens, Plowr. *Greenhithe*
 — Anemones, Pers. *Abbey Wood*
 — Apii, Corda. *Northfleet*
 — Cardui, Plowr. *Greenwich*
 — Caricis, Schum. *Speldhurst*
 — Circeæ, Pers. *Greenwich*
 — clandestina, Carm. *Joyden's Wood*
 — coronata, Corda. *Tunbridge Wells*
 — difformis, Fckl. *Greenhithe*
 — discoidearum, Link. *Northfleet*
 — Epilobii, D. C. *Tunbridge Wells*

A HISTORY OF KENT

UREDINEÆ (continued)

- Puccinia Galii, Pers. *Green-bithe*
 — graminis, Pers. *Greenwich, Dartford*
 — Iridis, D. C. *Swanscombe Wood*
 — Lychnidearum, Fückl. *Greenwich*
 — Malvacearum, Mont. *Sydenham, Greenwich*
 — Menthæ, Pers. *Greenwich*
 — perplexans, Plowr. *Maidstone*
 — pulverulenta, Grev. *Greenwich*
 — Saniculæ, Grev. *Bidborough, Darent, Joyden's Wood*
 — Saxifragarum, Schlecht. *Greenbithe, Greenwich*
 — Scorodoniæ, Link. *Greenwich*
 — sparsa, Corda. *Darent*
 — striola, Link. *Greenwich*
 — Trailii, Plowr. *Greenwich*
 — Tragopogonis, Pers. *New Cross*
 — Umbilici, Guép. *Darent Wood*
 — variabilis, Grev. *Tunbridge Wells*
 — Vincæ, Berk. *Greenwich*
 — violarum, Link. *Abbey Wood, Borough Green*
 Triphragmium Ulmarie, Link. *Greenwich*
 Uredo Agrimonie, D. C. *Sydenham, Maidstone*
 — Iridis, Thurm. *Darent*
 — polypodii, Pers. *Greenwich*
 Uromyces apiculosa, Lév. *Tunbridge Wells*
 — Orobis, Wint. *Tunbridge Wells*
 — sparsa, Kze. & Schum. *Northfleet*
 — valerianæ, Wint. *Speldhurst*
 Urocystis Violæ, B. & Br. *Sevenoaks*
 Ustilago antherarum, Fr. *Bexley*
 — carbo, Tul. *Greenwich*
 — hypodytes, Fr. *New Cross*
 — longissima, Tul. *Greenwich*
 — receptaculorum, Fr. *New Cross*

HYPHOMYCETES

MUCEDINEÆ

- Oospora favorum, Sacc. *Woolwich*
 Fusidium griseum, Link. *Dartford*

MUCEDINEÆ (continued)

- Monilia fructigena, Pers. *Swanscombe*
 Cylindrium flavovirens, Ditm. *Darent*
 Oidium Balsamii, Mont. *Sydenham*
 — erysiphoides, Fr. *Dartford*
 — Tuckeri, Berk. *Margate*
 — fructigenum, Schrad. *Greenwich, Darent*
 Aspergillus candidus, Link.
 — flavus, Link. *Blackbeath*
 — glaucus, Link. *Sydenham, Greenwich*
 — virens, Link. *Sydenham*
 Pencillium candidum, Link. *Greenwich*
 — crustaceum, Fr. *Greenwich*
 Polyactis cana, Berk. *Sydenham*
 — cinerea, Berk. *Darent, Greenwich*
 — vulgaris, Link. *Sydenham, Greenwich*
 Haplaria grisea, Link. *Margate*
 Rhinotrichum Opuntia, B. & Br. *Woolwich*
 Asterophora agaricola, Corda. *Darent*
 Botrytis argillacea, Cook. *Darent*
 — Jonesii, B. & Br. *Woolwich*
 — Tilletii, Desm. *Darent*
 — terrestris, Pers. *Sydenham, Darent*
 Sepedonium chrysospermum, Link. *Greenwich, Sydenham*
 — roseum, Berk. *Darent, Greenwich*
 Verticillium agaricinum, Corda. *Darent*
 — lateritium, Berk. *Elmstead*
 Peronospora grisea, Ung. *Margate*
 — infestans, Mont. *Greenwich*
 — parasitica, Corda. *Tunbridge Wells*
 — pygmæa, Ung. *Swanscombe Wood*
 Nematogonium aureum, Berk. *Greenwich, Sydenham*
 Trichothecium roseum, Link. *Darent*
 Dactylium dendroides, Fr. *Darent*

DEMATICÆ

- Torula herbarum, Link. *Dartford*
 — monilioides, Corda. *Greenwich*
 — ovalispora, Berk. *Tunbridge Wells*

DEMATICÆ (continued)

- Torula pulveracea, Corda. *Darent*
 Hormiscium hysteroides, Sacc. *Chislehurst*
 Zygodemus terrestris, B. & Br. *Crundall*
 Monatospora repens, Mass. *Chislehurst*
 Dematium hispidulum, Fr. *Dartford, Greenwich*
 Cladosporium herbarum, Link. *Greenwich*
 Helminthosporium folliculatum, Corda. *Darent*
 — macrocarpum, Grev. *Darent*
 — parvum, Grove. *Darent*
 — scolecoides, Corda. *Sydenham*
 — Smithii, B. & Br. *Greenwich, Chislehurst*
 — velutinum, Link. *Swanscombe*
 Coniothecium amentacearum, Corda. *Brockley, Darent, Tonbridge*
 Brachysporium apicale, Sacc. *Swanscombe*
 Dictyosporium elegans, Corda. *Brockley*
 Stemphylium fuscum, Curr. *Blackbeath*
 Macrosporium cladosporoides, Desm. *Dartford*
 Triposporium elegans, Corda. *Darent*
 — Ficinuum, Preuss. *Bexley*
 Sporidesmium Cladosporii, Corda. *Darent*
 Dendryphium comosum, Wallr. *Darent, Chislehurst*
 — ramosum, Cooke. *Darent*
 Heterosporium echinulatum, Cooke. *Chislehurst*
 Cercospora mercurialis, Pers. *Darent*
- ## STILBÆ
- Stilbum fimetarium, Pers. *Elmstead*
 — tomentosum, Schr. *Greenwich*
 Isaria crassa, Link. *Kent*
 — farinosa, Fr. *Darent, Greenwich, Blackbeath*
 — fuciformis, Berk. *Ashford*
 — umbrina, Pers. *Sydenham*
 Ceratium hydroides, A. & S. *Sydenham, Greenwich*
 Sporocye byssoides, Pers. *Darent*
 Graphium glaucocephalum, Corda. *Burnt Ash Lane*
 Stysanus stemonitis, Corda. *Sydenham, Chislehurst*

BOTANY

STILBEE (continued)

- Graphiothecium parasiticum, Desm. *Dartford*
Cylindrocolla urticae, Bon. *Eltham, Darenth, Tunbridge*
Volutella setosa, Berk. *Dartford*
Fusarium sarcocroum, Sacc. *Sydenham*
Epicoccum neglectum, Desm. *Sydenham*

PHYSOMYCETES

- Acrostalagmus cinnabarinus, Corda. *Greenwich*
Mucor caninus, Pers. *Chislehurst, Greenwich*
— fusiger, Link. *Chislehurst*
— mucedo, Linn. *Sydenham, Greenwich*
— ramosus, Bull. *Sydenham, Greenwich*
Pilobolus crystallinus, Tode. *Sydenham*
— roridus, Schum. *Greenwich*
Saprolegnia ferax, Kütz. *Sevenoaks*
Sporodinia dichotoma, Cord. *Sydenham*

PYRENOMYCETES

HYPOCREACEÆ

- Claviceps purpurea, Fr. *Burnt Ash Lane*
— nigricans, Tul. *Wands-worth Common*, only found in Britain on Eleocharis
Cordyceps capitata, Holms. *Southborough*
— entomorrhiza, Dicks. *Southborough*
— militaris, Fr. *Rusthall Common, Sydenham Hill*
Epichloe typhina, Sacc. *Sevenoaks, Queensdown Warren, New Cross, Southborough, West Malling*
Nectria cinnabarina, Tode. *Sevenoaks, Sydenham, Tunbridge Wells*
— mammoidea, Plow. *Seal Park*
— inaurata, B. & Br. *Greenwich*
— epispheeria, Fr. *Greenwich*
Dialoectria aurea, Grev. *East Farleigh*
Hypocrea gelatinosa, Fr. *Greenwich*
Acrosperrum graminum, Lib. *Dartford*

XYLARIACEÆ

- Xylaria digitata, Grev. *Sydenham Hill, Greenwich, Tunbridge Wells*
— Hypoxylon, Grev. *Sydenham Hill, Southborough*
— polymorpha, Grev. *Sydenham Hill, Sevenoaks*
Thamnomycetes hypotrichoides, Ehrb. *Cobham*
Ustilina vulgaris, Tul. *Sevenoaks*
Daldinia concentrica, Sacc. *Sevenoaks, West Malling*
Hypoxylon argillaceum, Fr. *Tunbridge Wells*
— coccineum, Bull. *Sydenham, Tunbridge Wells*
— cohærens, Pers. *Darenth*
— fuscum, Pers. *Darenth, Greenwich, Igham*
— multiforme, Fr. *Sydenham, Sevenoaks, Greenwich, Tunbridge Wells*

DOTHIDEACEÆ

- Phyllachora Caricis, Fr. *Sevenoaks*
— Pteridis, Reb. *Darenth, Tunbridge Wells*
— Ulmi, Sacc. *Tunbridge Wells, Greenwich*
Dothidea ribesia, Pers. *Tunbridge Wells*
— filicina, Fr. *Southborough*
— graminis, Fr. *Greenwich*
Rhytisma acerinum, Pers. *Sevenoaks*
Stigmatea Robertiani, Fr. *Darenth Wood*

DIATRYPACEÆ

- Diatrype angustata, Fr. *Greenwich*
— aspersa, Fr. *Eltham, Burnt Ash Lane, Tunbridge Wells*
— bullata, Fr. *Greenwich*
— disciformis, Fr. *Greenwich*
— cincta, B. & Br. *Blackbeath*
— corniculata, B. and Br. *Tunbridge Wells*
— favacea, Fr. *Chislehurst*
— ferruginea, Fr. *Darenth, Tunbridge Wells*
— flavovirens, Fr. *Darenth, Greenwich*
— hystrix, Fr. *Chislehurst*
— nigro-annulata, Grev. *Chislehurst*
— quercina, Pers. *Sydenham Hill*
— stigma, Hoffm. *Darenth, Chislehurst, Tunbridge Wells, Blackbeath, Greenwich*
— strumella, Fr. *Dartford*

DIATRYPACEÆ (continued)

- Diatrype turgida, Fr. *Eltham, Eynsford*
— undulata, Fr. *Greenwich*
— varians, Curr. *Eltham*
— verrucæformis, Ehr. *Dover, Greenwich, Abbey Wood*

VALSACEÆ

- Valsa Aceris, Fekl. *Darenth*
— æsculicola, Cke. *Sydenham*
— ambiens, Fr. *var. Cratægi*
— ceratophora, Tul. *Elmstead*
— cornicola, Cke. *Darenth*
— dissepta, Fr. *Blackbeath*
— enteroleuca, Fr. *Blackbeath*
— extensa, Fr. *Chislehurst*
— faginea, Curr. *Eltham Grove*
— leiophemia, Fr. *Tunbridge Wells*
— nivea, Sacc. *Sydenham*
— oncostoma, Duby. *Darenth*
— querneæ, Curr. *Darenth*
— salicina, Fr. *Tunbridge Wells*
— stellulata, Fr. *Eltham Grove*
— stilbostoma, Cke. *Swanscombe*
— suffusa, Fr. *Goddens Green*
— tetraploa, B. & C. *Elmhurst*
Melanconis modonia, Fr. *Darenth*
— stilbostoma, Fr. *Blackbeath*
— thelebola, Fr. *Chislehurst*
— Tilix, Fr. *Blackbeath*
Pseudovalsa Berkeleyi, Tul. *Greenwich*
— lanciformis, Tul. *Greenwich*
— longipes, Tul. *Chislehurst*
— profusa, De Not. *Blackbeath Park*
Fenestella vestita, Fr. *Chislehurst, Eltham Grove*

EUTYPACEÆ

- Eutypa lata, Fr. *Sydenham*
— spinosa, Pers. *Eltham*
— nummularia Bulliardii, Tul. *Greenwich*
Diaporthe adunca, Desm. *Kent (Massee)*
— Beckhausii, Ntke. *Darenth*
— cryptica, Ntke. *Kent (Massee)*
— Euphorbiae, Cke. *Darenth*
— Phyllireae, Cke. *Kent (Massee)*
— quadrinucleata, Curr. *Eltham*
— Sarothamni, Awd. *Darenth*
— scobina, Ntke. *Darenth*

A HISTORY OF KENT

CUCURBITARIACEÆ

- Cucurbitaria Berberidis, Sacc.
Hayes
— elongata, Fr. Swanscombe
— Spartii, N. Darentb

SUPERFICIALES

- Lasiosphæria superficialis, Curr.
Kent (Massee)
Coniochæta capillifera, Curr.
Kent (Massee)
Venturia ditricha, Fr. Darentb
— inæqualis, Cke. Darentb
— Potentillæ, Fr. Darentb
Chætomium atrum, Link.
Swanscombe
Sordaria caudata, Cke. Black-
beath

PERTUSÆ

- Amphisphæria brachythele,
B. & Br. Chislehurst

LOPHIOSTOMACEÆ

- Lophiostoma arundinis, Fr.
Chislehurst
— bicuspidatum, Cke. Dar-
entb
— hysterioides, Curr. Chisle-
hurst

CERASTOSTOMACEÆ

- Gnomonia Ariæ, Fckl. Dar-
entb, Shoreham
— Avellanæ, Sch. Darentb
— Coryli, Batsch. Bexley,
Darentb
— setacea, Pers. Bexley, Dar-
entb
— vulgaris, Cke. Bexley, Dar-
entb
Lentomita ligneola, B. & Br.
Sydenham

OBTECTÆ

- Massaria bufonia, B. & Br.
Eltham
— Curreyi, Tul. Blackbeath,
Eltham Park
— foedans, Fr. Blackbeath,
Eltham
— gigaspora, Fckl. Black-
beath, Darentb
— inquinans, Tode. Sydenham
— siparia, B. & Br. Black-
beath
Enchnoa infernalis, Kze. & Fr.
Sydenham
Leptosphæria Tamaricis, Grev.
Dover
Delacourea eustegia, Cke.
Swanscombe

CAULICOLÆ

- Phomatospora Berkeleyi, Sacc.
Bexley
Raphidospora Urticæ, Rabh.
Darentb
Heptameria clara, Cke. Sand-
gate
— divensis, B. & Br. Darentb
Wood

CAULICOLÆ (continued)

- Heptameria maculans, Desm.
Darentb
— planiuscula, B. & Br. Chisle-
hurst
— unicaudata, B. & Br. Dar-
entb
— Vectis, B. & Br. Darentb
Pleospora platyspora, S. Dar-
entb

FOLICOLÆ

- Læstadia acerifera, Cke. Dar-
entb
Sphærella aquilina, Fr. Dar-
entb
— arcana, Cke. Darentb
— atomus, Desm. Darentb
— hieracii, Cke. & Mass.
Tunbridge Wells
— Ligustri, Desm. Dartford
— maculæformis, P. Darentb
— oblivia, Cke. Darentb Wood
— sparsa, Wallr. Darentb

ASCOMYCETES

ASCOMYCEÆ

- Ascomyces deformans, Berk.
Sevenoaks
— Pruni, Fckl. Sevenoaks
— turgidus, Phil. Sevenoaks

HYSTERIACEÆ

- Hysterium angustatum, A. & S.
Ightham
— pulicare, Pers. Chelsfield,
Ightham
Hystero-graphium elongatum,
Corda. Tunbridge Wells
— Fraxini, De Not. Green-
wich, Tunbridge Wells
Hypoderma virgultorum, D. C.
Greenwich
Lophodermium pinastri, Chev.
Tunbridge Wells
Dichæna faginea, Fr. Seven-
oaks
— quercina, Fr. Sevenoaks

DISCOMYCETES

PHACIDEACEÆ

- Colpoma quercinum, Walk.
Greenwich, Darentb, Tun-
bridge Wells, Ightham
Rhytisma acerinum, Fr. Seven-
oaks
Trochila ilicis, Cr. Greenwich,
Chislehurst

STICTEÆ

- Stictis radiata, Pers. Green-
wich
Propolis faginea, Karst. Green-
wich

DERMATEÆ

- Cenangium Cerasi, Mass.
Greenwich
Scleroderris rubi, Mass. Green-
wich

DERMATEÆ (continued)

- Scleroderris fuliginosa, Karst.
Greenwich
— livida, Mass. Sydenham
Hill

BULGARIEÆ

- Bulgaria polymorpha, Wettst.
Sydenham, Hayes, Green-
wich, Halstead, Sevenoaks
Orbilbia vinosa, Karst. Green-
wich
— leucostigma, Fr. Green-
wich

ASCBOLEÆ

- Ascobolus furfuraceus, Pers.
Greenwich, Sydenham
— immersus, Pers. Sydenham
Hill
Ascophanus argenteus, Bond.
Eltham
— carneus, Bond. Sydenham
Hill, Chislehurst

PEZIZÆ

- Pseudopeziza albella, Mass.
Greenwich
— palustris, Mass. Chisle-
hurst
Mollisia atrata, Pers. Darentb,
Greenwich
— cinerea, Kant. Darentb,
Sydenham, Tunbridge
Wells
— fusca, Mass. Darentb
Belonidium lacustre, Phil.
Darentb, Blackbeath
— pruinusum, Mass. Syden-
ham
Helotium aquaticum, Curr.
Chislehurst
— citrinum, Fr. Greenwich
var. pallescens, Mass.
Greenwich
— conigerum, Fr. Greenwich
— cyathoides, Karst. Green-
wich
— fagineum, Fr. Greenwich
— herbarum, Fr. Greenwich
— luteolum, Curr. Chisle-
hurst
— ochraceum, Berk. Syden-
ham Hill
— tuba, Fr. Chislehurst
— virgultorum, Karst. Green-
wich
Sclerotinia Curreyana, Karst.
Greenwich
Chlorosplenium æruginosum,
De Not.
Kemsing, Sevenoaks
Diplocarpa Curreyana, Mass.
Joyden's Wood
Lachnea scutellata, L. Green-
wich, Sydenham, Tun-
bridge Wells
— umbata, Phil. Tunbridge
Wells

BOTANY

PEZIZÆ (continued)

- Lachnella conformis, Ck. *Darentb*
 Dasyscypha barbata, Mass. *Sevenoaks*
 — Berkeleyi, Mass. *Darentb*
 — bicolor, Fckl. *Ightham, Tunbridge Wells*
 — calycina, Fckl. *Greenwich, Sydenham*
 — dematiicola, Mass. *Darentb*
 — hyalina, Mass. *Darentb*
 — Pteridis, Mass. *Darentb*
 — sulphurea, Mass. *Darentb*
 — Tami, Mass. *Darentb*
 — virginea, Fckl. *Greenwich, St. Mary Cray, Sydenham, Tunbridge Wells*
 Neottiella nivea, Sacc. *Darentb, Greenwich*
 — Polytrichi, Mass. *Sevenoaks*
 Geopyxis coccinea, Jacq. *Maidstone, St. Mary Cray, Southborough*
 — cupularis, Sacc. *Sevenoaks*
 Barleæa constellatio, Sacc. *Addington*

PEZIZÆ (continued)

- Barleæa Crouani, Cke. *Ightham*
 Humaria domestica, Mass. *Greenwich*
 — granulata, Sacc. *Sydenham, Ightham, Tunbridge Wells*
 — humosa, Fr. *Greenwich, Tunbridge Wells, Dover*
 Peziza badia, Pers. *Hayes*
 — repanda, Wahlenb. *Kemsing*
 — venosa, Pers. *Hayes*
 — vesiculosa, Bull. *Greenwich*
 Otidea aurantia, Mass. *Greenwich, Sydenham, Sevenoaks*
 — cochleata, Fckl. *Greenwich*
 Rhizina inflata, Quel. *Seal, Chart*

HELVELLEÆ

- Helvella crispa, Fr. *Dunton Green, Godden Green, Tonbridge*
 — elastica, Bull. *Greenwich, Rustball Common*

HELVELLEÆ (continued)

- Helvella lacunosa, Afz. *Greenwich, Shoreham, Otford*
 — macropus, Karst. *Greenwich*
 — acicularis, Pers. *Tunbridge Wells*
 Leotia lubrica, Pers. *Greenwich, Shoreham, Tunbridge Wells*
 Morchella esculenta, Pers. *Greenwich, Sevenoaks*
 Gyromita gigas, Cke. *Blackheath*
 Mitrula phalloides, Chev. *Keston Common*
 Spathularia clavata, Sacc. *Shoreham*
 Geoglossum difforme, Fr. *Tunbridge Wells*
 — hirsutum, Pers. *Deal*

TUBERACEÆ

- Tuber excavatum, Vitt. *Deal, Otford.*
 Elaphomyces granulatus, Fr. *Sevenoaks, Tonbridge, Tunbridge Wells*

ZOOLOGY

MARINE ZOOLOGY

IT is now a number of years since I studied the marine animals in any part of Kent, and then only in a few places suitable for living on board my yacht *Glimpse*. There are long stretches of coast quite unfit for this, which I have never examined ; and probably the number of animals which I have been able to collect falls far short of what could be found if the whole coast were adequately examined. I have studied more or less completely seven different localities, viz., the Thames near Greenhithe and Erith ; the Medway at and above Chatham ; the Swale at and above Queenborough ; Ramsgate ; the Stour above and below Sandwich ; Dover and the middle of the Straits of Dover. Some of these can scarcely be called marine localities, but are of interest in showing the changes which occur in passing down the lower end of rivers to the sea. My knowledge of the coast being thus confined to only a few districts, it would have been impossible for me to deal with my subject in anything like a satisfactory manner, if it had not been for the kind assistance of Mr. Sibert Saunders of Whitstable, Mr. Edward Horsnail of Folkestone, and Mrs. Hillier, widow of the late Dr. Hillier of Ramsgate. Fortunately these had studied quite different parts of the coast, and had collected animals belonging to groups which I had neglected, whereas I had studied those to which they had paid little or no attention. The result is that I am able to give a better account of the subject than at one time I thought possible. On the whole it seems to me best to describe my observations in different localities, and to give entire the list of animals found by my friends elsewhere, modifying some of the names so as to correspond with those in my article on the marine biology of Essex.¹ This plan will to some extent show local variations.

SALINITY OF THE WATER.

Since the distribution of the various animals depends so much on the salinity of the water, it will be well to consider this first. I have carefully studied it over a wide area in the district of the Thames estuary, along the coasts of Suffolk, Essex and Kent during the months of May to September inclusive, and found that no very considerable difference materially influences the distribution of the animals, unless it be that other conditions influence both. My observations along the

¹ *V.C.H. Essex*, i. 69.

A HISTORY OF KENT

coast of Kent are much more limited than on the other side of the estuary, but, as far as they go, they show that in summer the density off Ramsgate is about the same as in the North Sea off Lowestoft, and at the Nore about the same as in the Swin, being less than in the Wallet along the coast of Essex, probably because there is a much larger area of shallow water than along the coast of Kent exposed to evaporation in summer. Possibly this is one reason amongst several others why the animals differ materially.

The Swale at and above Queenborough is really a strait and not an estuary, and at Queenborough there is only a small difference between the density of high and low water, which plays such an important part in some estuaries. There is only a small decrease in that part of the Swale near Milton Creek, which is farthest removed from the two openings into the sea. These facts probably explain why, on the whole, the animals found in the Swale differ considerably from those met with in the estuaries of Essex and Suffolk.

The Medway up to and beyond Chatham, the Stour up to and beyond Sandwich, and the Thames up to and beyond Erith, are examples of the opposite extreme, the water being in some places almost as salt as the sea when the tide is high, and almost fresh when it is low. These facts have, of course, an immense influence on the distribution of the animals along the north coast of Kent.

THE SWALE NEAR QUEENBOROUGH.

I have dredged and otherwise studied the Swale from its junction with the Medway right up to Milton Creek. One thing which struck me much was the great difference in the number and species of the animals met with in different years. For example, on one occasion I found the bottom almost covered with an enormous number of small mussels, and there were few starfish. The next year these seemed to have invaded the district, and almost or entirely cleared the ground of mussels. One year the beautiful medusa, *Chrysaora isosceles* (Linn.), was very common, but in other years almost or quite absent. In one year I saw off the Nore more large individuals of *Rhizostoma octopus* (Linn.) than I ever saw there or anywhere else. The other Medusæ seen more or less frequently were *Aurelia aurita* (Linn.) and *Cyanea capillata* (Linn.). *Pleurobrachia pileus* (Modeer) was common. An unidentified *Beroë* was also found. The number of *Noctiluca miliaris* was sometimes very great. In July 1883 the average number from top to bottom of the water was about 750 per gallon, and occasionally many more.

Before it was burned down I used to find on the old pier many specimens of the white, the flesh coloured and the dark brown varieties of *Actinoloba dianthus* (Ellis), *Sabella pavonia* (Sav.), and a nemertian worm, probably *Serpentaria fusca* (B.M. Cat. of Worms) which could extend itself in a remarkable manner. From the mud banks I obtained *Nereis diversicolor* (Müller) ; but by far the most interesting polychæte

MARINE ZOOLOGY

worm seen was met with only in the *Heteronereis* condition. The first occasion was at Sheerness in the evening of 11 May, 1882, when a considerable number were swimming near the surface at a rate of a few miles an hour. At first I thought they were small red fish, and on catching some was astonished to find that they were worms. Fortunately some have been preserved in the public museum at Sheffield, and have been identified by Dr. E. J. Allen as the heteronereis of *Nereis longissima*. He informs me that Dr. Jonathan Herder observed a similar display at Plymouth in April, 1865, but that nothing of the kind has been seen there in more recent years. Those obtained at Plymouth were 6 or 7 inches long, whereas those at Sheerness were only $4\frac{1}{2}$. The only other occasion on which I have seen any was in the evening of 9 September, 1889, at Queenborough, when the above-named species was abundant. I never found this species in an unmodified state in any part of the Queenborough district. Though I have been very anxious to obtain other specimens, I never saw a single individual in the same or subsequent years; and it thus appears that, as in the case of *Nereis dumerilii* (Aud. and M. Edw.) found in Essex and Suffolk, the heteronereis is very seldom seen, and then great numbers almost simultaneously appear, swimming at the surface for a few hours, being a most striking spectacle.

About a mile above Queenborough the Swale makes a remarkably sudden turn, which has caused the tidal currents to excavate a large hole, at least 8 fathoms deep, which is about four times the depth of the water above or below. This is the only locality in the Thames district where I have dredged *Dendronotus frondosus* (Ascanius). Higher up I obtained a number of fine specimens of the beautiful nudibranch *Eolis papillosa* (Linn.) of which I never saw but one individual in Essex or Suffolk. *Acanthodoris pilosa* (Müller) is not uncommon in the Queenborough district. One of the most striking peculiarities in the Swale near Kingsferry is the great number of the common shore crab (*Carcinus mænas*) (Linn.), the spider crab (*Stenorhynchus rostratus*) and sponges, chiefly *Halichondria panicea* (Pallas), and the remarkably small number of simple or compound ascidians; in fact, on the whole, this narrow strait differs much from any other locality in the Thames district, probably because it combines the shelter of an estuary with the salinity of the more open water. Besides the above-named animals I have found in the Queenborough district *Tubularia larynx* (Ellis and Sol.), *T. indivisa*, *Solaster papposus* (Fabr.), *Ophiura ciliaris* (Linn.), *Ophiobrix fragilis* (O. F. Müller), *Caprella linearis*, *Idotea linearis* and many excellent specimens of *Lerneonema sprattæ*, obtained from the whitebait caught in such vast numbers. *Appendicularians* (*Oikopleura* sp.) occur in sievings of the sea-water.

RAMSGATE.

I have never examined any locality in which several species of compound ascidians were seen to such great perfection as at Ramsgate in the covered passages through which the water could be let out from

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the inner into the outer harbour. In 1882 the surface was covered with them, and among the most striking were various species or varieties of *Botryllus*. These were not identified at the time, and the few specimens preserved in the Public Museum at Sheffield could not now be identified in a satisfactory manner, but are probably *Botryllus schlosseri* and *polycyclus*. *Botrylloides rubrum* (M. Edw.) or a closely allied species, and very fine specimens of *Polyclinum aurantium* also occurred. Of simple ascidians *Ascidella aspersa* (O. F. Müller), and I think a few individuals of *A. virginea* (O. F. M.) were found, and *Ciona intestinalis* (Linn), of larger size than any seen in Essex or Suffolk, those 6 inches long being common.

STRAITS OF DOVER.

On one occasion I dredged between Dover and Boulogne, and found many fine specimens of *Alcyonium digitatum* (Linn.) and many sponges, chiefly if not entirely, *Halichondria panicea* (Pallas).

THE THAMES AT GREENHITHE AND ERITH.

In 1882 and 1883 I spent a number of weeks on my yacht off Greenhithe and Erith, studying the water of the Thames on behalf of the Board of Works. The greater part of my observations have only an indirect connexion with marine biology, and I describe only a few of my results. Much depends on the very strong tide, which causes a great difference in the character of the water at different times of day, which alternates between fresh and very salt. Few or no sedentary animals are able to live under such conditions. Besides this in some places the material deposited at the bottom at the period of the neap tides is carried away by the much stronger current of the spring tides. The living animals swimming in the water, of which I determined the number per gallon, were those which move up and down in the water, and at high tide many small shrimps were met with, whereas the low water is mainly characterized by the presence of such forms as *Cyclops* and *Daphne*. *Gammarus* occurs in about equal numbers in high and low water. As bearing on the removal of sewage from the water by *Copepoda* I may say that I found they lived about six times as long when small quantities of human excrement were added to the water as when none was added. Those living in the low water soon died in the high water, and one part of sea water added to two or three of fresh soon proved fatal, which explains what I observed where semi-marine conditions occur along the northern shore of Kent.

THE MEDWAY.

In passing down the Medway from Allington to Sheerness, the conditions are much modified by the great extent to which the tide runs out in the upper part; and the amount of salt in the water where a well-marked maximum in the number of *Copepoda* occurs appears not to be the same as in the estuaries in Essex and Suffolk.

MARINE ZOOLOGY

SANDWICH.

One of the most interesting facts connected with the marine animals in the neighbourhood of Sandwich is the evidence furnished by the mollusca of the great changes known to have occurred during the historical period. *Scrobicularia plana* (da Costa) in a living state is found only some way below Sandwich, but dead shells in good preservation, in the position they had when living, are found in the mud of the Great Stour, near Stourmouth, where they no doubt lived when there was an open channel round by Reculver, which is now completely closed.

MARINE ANIMALS IN THE NEIGHBOURHOOD OF WHITSTABLE.

The following is a list of the invertebrate animals belonging to certain groups found in the neighbourhood of Whitstable, for which I am indebted to Mr. Sibert Saunders of that place. The names are those given to me by him, except in the case of the Nudibranchs and Ascidians, in which I give those adopted respectively by the Conchological Society and by Professor Herdman.

PROTOZOA

Noctiluca miliaris

PORIFERA

Tethea lyncurium
Halichondria panicea
Cliona celata
— gorgonioides
Dysidea fragilis
Grantia ciliata

HYDROZOA

Clava multicornis
Hydractinia echinata
Coryne pusilla
— ramosa
Eudendrium ramosum
Tubularia indivisa
— larynx
Halecium halecinum
Sertularia rugosa
— rosacea
— pumila
— gracilis
— tamarisca
— filicula
— abietina
— operculata
— argentea
— cupressina
Hydrallmania falcata
Aglaophena pluma
— tubulifera
— pennatula
Antennularia antennina

Plumularia pinnata
— setacea
Obelia gelatinosa
— geniculata
— dichotoma
— flabellata
Campanularia volubilis
— integra

CTENOPHORA

Beroë fulgens
Pleurobrachia pileus (Moder)

ANTHOZOA

Alcyonium digitatum
Actinoloba dianthus
Sagartia troglodytes
Tealia crassicornis

Though Actinia mesembryanthemum is not found at Whitstable, it is plentiful on the shore to the east of Birchington.

ANNELIDA

APODA

Pontobdella muricata

POLYCHÆTA

Aphrodita aculeata
Lepidonotus cirratus
Nereis sp.
Nephtys cæca
Phyllodoce viridis
— lamelligera
Spio seticornis
Cirratulus cirratus
Arenicola marina

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POLYCHÆTA (*continued*)

Lanice conchilegia (Pall.)
Pectinaria belgica (Pall.)
Sabellaria tubularia (?)
— alveolata
Serpula vermicularis

POLYZOA

Tubulipora sp.
Scrupocellaria scruposa
— reptans
Bicellaria ciliata
Bugula purpurincta
— avicularia
— plumosa
Crisidia cornuta
Crisia eburnea
— aculeata
— geniculata
— denticulata
Flustra foliacea
Cellepora pumicosa
Membranipora pilosa
— membranacea
Hippothoa divaricata

Beania mirabilis
Gamellaria loricata
Alcyonidium galatinosum
— parasiticum
Cycloum papillosum
Amathia lendigera
Vesicularia spinosa
Valkeria cuscuta
Bowerbankia imbricata
Farella repens
Pedicellaria cernua

NUDIBRANCHIATA

Facelina coronata (Forbes and Goodsir)
Fiona marina (Forskol)
Archidoris tuberculata (Cuvier)

TUNICATA

Ascidella virginea (O. F. Müller)
Clavelina lepadiformis (O. F. Müller)
Aplidium fallax (Johns)
Botryllus violaceus
— smaragdeus
Perophora listeri
Leptoclinum gelatinosum

MARINE ANIMALS IN THE NEIGHBOURHOOD OF FOLKESTONE.

The following is a list of animals of certain groups found in the neighbourhood of Folkestone, kindly supplied to me by Mr. Edward Horsnaill of that place; but in some cases I have altered his names so as to correspond with those adopted in this series.

ANNELIDA

Apoda

Tristoma molae. On a short sunfish caught off
Folkestone
Pontobdella muricata. *Whitstable*

CHAETAPODA

Sabellaria alveolata. *St. Margaret's Bay* and
Kingsdown, between *Dover* and *Deal*
Terebella. Common between tide marks
Serpula triquetra. Common between tide marks
Spirorbis. Common on sea weeds
Arenicola. In deep sand
Aphrodita aculeata. Common on mud bot-
tom. Often very plentiful on *Dungeness*
Beach
Polynoe sp. Common between tide marks
Sabella. A large species is very common at
Whitstable. Probably *S. pavonina* (Sav.)

MOLLUSCA

NUDIBRANCHIATA

Eolis papillosa (Linn.). Fairly common under
stones between tide marks
Facelina coronata (Forbes and Goodsir). Be-
tween tide marks in summer
Tritonia hombergi (Cuvier). *Dymchurch*. Rare
Archidoris tuberculata (Bergh.). Not very un-
common in the Laminarian Zone

Lamelledoris bilamellata (Linn.). Comes inshore
to spawn about May or June, and may
be found on rocks between tide marks

ECHINODERMATA

Echinus milliarius (Linn.). Common
Echinocyamus pusillus. From deep water and on
Eschara
Spatangus purpureus. From deep water
Palmipes membranaceus. Rare, but now and then
brought from deep water
Solaster papposus (Fabr.). Common in deeper
water and very plentiful on the *Whitstable*
oyster beds
Cribella oculata. Found occasionally in summer;
no doubt often passed over as *Asterias rubens*
Asterias rubens. Common everywhere on the coast
Ophiothrix fragilis (O. F. Müller). Common in
deep water round the coast
— neglecta. Very plentiful between tide marks
near *Dover*
Ophiura ciliaris (Linn.). Common at *Whitstable*
between tide marks
One or two unidentified species
In addition to the above the *British Association*
Handbook for Dover gives as found on the Kentish
coast *Astrophyton scutatum*, *Amphidotus cordatus*,
Doto coronata, *Aplysia punctata* and *Sigartia*
minata

MARINE ZOOLOGY

The following is a list of shells collected by the late Dr. Hillier of Ramsgate in that district, kindly supplied to me by Mrs. Hillier, now of St. Albans. I have adopted the nomenclature of the Conchological Society as given in the *Journal of Conchology* vol. x. p.9. 1901, stating the author of the specific rather than of the generic names; but in addition, when different, I have also given in brackets the names used by Forbes and Hanley, which appear to have been those adopted by Dr. Hillier.

Nucula nucleus (Linn.)
Nuculana minuta (Müll.). (*Leda caudata*)
Anomia ephippium (Linn.)
Glycimeris glycimeris (Linn.). (*Pectunculus* g.)
Barbatia lactea (Linn.). (*Arca* l.)
Mytilus edulis (Linn.)
Volsella modiola (Linn.). (*Modiola* m.)
— *barbata* (Linn.). (M. b.)
— *adriatica* (Lam.). (M. tulipa)
Ostrea edulis (Linn.)
Pecten varius (Linn.)
— *opercularis* (Linn.)
Lima sp.
Lucina sp.
Montacuta substriata (Montagu)
Lepton squamosum (Montagu)
Scrobicularia plana (da Costa). (*S. piperata*)
Tellina crassa (Gmelin)
— *donacina* (Linn.)
— *tenuis* (da Costa)
— *fabula* (Gronovius)
Macoma balthica (Linn.). (*Tellina solidula*)
Donax vittatus (da Costa). (*D. anatinus*)
Mactra stultorum (Linn.)
Spisula elliptica (Brown). (*Mactrae*.)
Venus verrucosa (Linn.)
Timoclea ovata (Pennant). (*Venus ovata*)
Chameleæ gallina (Linn.) (*Venus striatula*)
Tapes virgineus (Linn.)
— *pullastra* (Montagu)
Cardium exiguum (Gmelin). (*C. pygmæum*)
— *edule* (Linn.)
Lævicardium norvegicum (Spengler). (*Cardium* n.)
Mya arenaria (Linn.)
— *truncata* (Linn.)
Corbula gibba (Oliv.). (*C. nucleus*)
Ensis ensis (Linn.). (*Solen*. e.)
— *siliqua* (Linn.). (*S.* s.)
Solen vagina (Linn.). (*S. marginatus*)
Saxicava rugosa (Linn.)
Pholas dactylus (Linn.)
Barnea candida (Linn.). (*Pholas* c.)
— *parva* (Pennant). (P. p.)
Zirfæa crispata (Linn.). (P. c.)
Teredo navalis (Linn.)
Lyonsia norvegica (Chemnitz)

SCAPHOPODA

Dentalium vulgare (da Costa). (*D. tarentinum*)

GASTROPODA

Patella vulgata (Linn.)
— *pellucida* (Linn.)
Acmaea virginea (Müller)
Emarginula fissura (Linn.). (*E. reticulata*)
— *conica* (Schumacher). (*E. rosea*)
Fissurella græca (Linn.). (*F. reticulata*)
Gibbula tumida (Montagu). (*Trochus* t.)
— *cineraria* (Linn.). (*T.* c.)
Calliostoma zizyphanus (Linn.). (*T.* z.)
Lacuna divaricata (Fabricius). (*L. vincta*)
— *pallidula* (da Costa)
Littorina obtusata (Linn.). (*L. littoralis*)
— *rudis* (Maton)
— *littorea* (Linn.)
Rissoa guerini (Recluz). (*R. costulata*)
Paludestrina stagnalis (Baster). (*Rissoa ulvæ*)
Capulus hungaricus (Linn.). (*Pileopsis* h.)
Calyptrea chinensis (Linn.)
Trivia europæa (Montagu). (*Cyprea* e.)
Natica catena (da Costa). (n. monilifera)
— *alderi* (Forbes)
Lamellaria perspicua (Linn.)
Velutina lævigata (Pennant)
Triforis perversa (Linn.). (*Cerithium adversum*)
Scala clathrus (Linn.). (*Scalaria communis*)
— *clathratula* (Adams). (*Scalaria* c.)
Cioniscus albidus (G. Adams). (*Acclis unica*)
Acclis ascaris (Turton)
Turbonilla lactea (Linn.). (*Chemnitzia elegantissima*)
Eulima polita (Linn.)
Cœcum glabrum (Montagu)
Turritella communis (Lamarck)
Buccinum undatum (Linn.)
Neptunea antiqua (Linn.). (*Fusus antiquus*)
Ocenebra erinacea (Linn.). (*Murex* e.)
Purpura lapillus (Linn.)
Nassa reticulata (Linn.)
— *pygmæa* (Lamarck)
Bela turricula (Montagu). (*Mangelia* t.)
— *rufa* (Montagu). (M. r.)
Tornatina obtusa (Montagu). (*Cyclichna* o.)
Philine aperta (Linn.)

It will thus be seen that by combining my own observations with those of others who have so kindly assisted me, it has been possible to give a fairly satisfactory account of some of the groups of marine animals met with both on the north and south-east coasts of Kent. At the same

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time several very important groups have been more or less completely overlooked by all of us. For example none of the lists contain any of the *Cephalopoda*, which I think I should have obtained if I had used my small trawl at Queenborough. When the Copepoda which I had collected and preserved in alcohol were examined it was found that they had deteriorated too much for proper identification. The sea spiders (*Pantopoda*) seem also to have been overlooked, except a small specimen of *Pycnogonum littorale* found by me at Queenborough. The Crustacea and fish are dealt with by other authors. Making due allowance for imperfect collecting, there appears to be a marked difference between the animals along the north and south-east shores of Kent, and still more so between both and the coasts of Essex and Suffolk. A number of animals which I have found in considerable quantity on one side of the Thames estuary I have never seen on the other side; and I am surprised to find how much difference there is between the species collected by others near Whitstable and Folkestone and those I have myself collected during many years along the coasts of Essex and Suffolk. I much regret that it is now out of my power to thoroughly investigate this wide and difficult question of local distribution.

MOLLUSCS

NON-MARINE

The non-marine mollusca are plentifully represented in Kent, the physical features of the county being eminently favourable to their development.

The terrestrial forms are more abundant throughout the northern portion, or chalk district, than in the sandy and clayey areas verging on the Weald, and find those varied conditions of bare down, or wooded dell and hedgerow, that suit the different requirements of the several species. One of these, *Helicella cantiana*, takes its name from the county, though this 'Kentish snail' is by no means confined to this area: it was apparently a late introduction into these islands, for it has not yet been found in any but the most recent post-tertiary deposits.

The aquatic forms are nearly all present and abound in the numerous ponds and streams as well as in the rivers; while the salt-marshes and estuaries of the coast provide suitable habitat for the brackish-water forms.

The literature on the subject is very scattered, and consists mainly of lists relating to isolated localities or notes concerning isolated occurrences. The most comprehensive paper is that on the 'Land Mollusca of Kent,' by A. Santer Kennard (*Kent. Mag.* 1896, i. 418). From these sources and the *Records* of the Conchological Society the sub-joined list has been compiled.

Of the 139 species occurring in the whole of the British Islands, no less than 111 may be met with in Kent. Among this number no account is taken of such records as *Helix pisana*, alleged to have been found near Folkestone, that was most probably only one of the endless varieties of the somewhat similar *Helicella virgata*. Nor is *Clausilia biplicata* counted, two examples of which were found in rejectamenta on the shore of Dartford Creek, whither they had probably been wafted by the Thames from some locality much higher up on its course. Still less is any notice taken of the *Helix cantianiformis*, a name bestowed by a French conchologist on some unimportant variety of the 'Kentish snail.' Nor has *Vivipara contecta* been included, though it once swarmed in a pond at Beckenham, since filled in, where it was apparently introduced.

Three other species occur in post-tertiary deposits of the county that have not yet been met with living in the district, viz.: *Vertigo antiverugo*, *V. pusilla* and *Succinea oblonga*. The first two may have been drifted down to their present place of sepulture, but the last-named was certainly at one time a snail of Kent.

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The two species of more particular interest in the assemblage, which is characteristic for the south-east of England, are *Helicella cartusiana* and *Helix pomatia*. The former is now a coastal species, practically confined to Kent and Sussex, but it formerly ranged into east Kent, being found in rain-wash deposits at Otford, Exedown and Greenhithe; it has also been obtained from a post-tertiary deposit at Felstead in Essex, and a single dead (and possibly fossil) example has been picked up at Long Stratton, Norfolk: it has even been reported from more remote localities, though these are doubtful records. The 'Roman snail' (*Helix pomatia*), long thought to have been introduced by the Romans, but now known to have been a denizen of this country before their arrival, is confined to the chalky ridge of the North Downs, along which it is met with at intervals to as far east as Charing, so that here as elsewhere in England it stops short of the sea.

A noteworthy absentee is *Dreissensia polymorpha*, so plentiful in the Thames further west, but nowhere recorded in Kent.

An introduction worthy of remark and one which may perhaps ultimately become established, is the pretty little conical *Helicella elegans*, for a colony of this species brought over from southern Europe has been settled near Dover, where it appears to be flourishing and spreading.

A. GASTROPODA

I. PULMONATA

a. STYLOMMATOPHORA

Testacella haliotideae, Drap. Sevenoaks; Beckenham
 — *scutulum*, Sby. Faversham; Folkestone; Mableton
Limax maximus, Linn.
 — *flavus*, Linn.
 — *arborum*, Bouch.-Chant. Local
Agriolimax agrestis (Linn.)
 — *lævis* (Müll.)
Amalia sowerbii (Fér.)
 — *gagates* (Drap.). Chatham; Wichling
Vitrina pellucida (Müll.)
Vitrea crystallina (Müll.)
 — *alliarum* (Miller)
 — *glabra* (Brit. Auct.)
 — *cellaria* (Müll.)
 — *nitidula* (Drap.)
 — *pura* (Ald.)
 — *radiatula* (Ald.)
 — *nitida* (Müll.)
 — *fulva* (Müll.) Local
Arion ater (Linn.)
 — *bortensis*, Fér.
 — *circumscribitus*, John.
 — *intermedius*, Norm. Bromley
 — *subfuscus* (Drap.). Wichling
Punctum pygmaeum (Drap.)

Pyramidula rupestris (Drap.). Sevenoaks; Dover
 — *rotundata* (Müll.)
Helicella virgata (Da C.)
 — *itala* (Linn.)
 — *caperata* (Mont.)
 — *cantiana* (Mont.)
 — *cartusiana* (Müll.)
Hygromia fusca (Mont.). Maidstone
 — *granulata* (Ald.)
 — *hispidula* (Linn.)
 — *rufescens* (Penn.)
Acanthinula aculeata (Müll.). Local
Vallonia pulchella (Müll.)
Helicigona lapicida (Linn.)
 — *arborum* (Linn.)
Helix aspersa (Müll.)
 — *pomatia*, Linn. Brasted; Cudham; Otford; near Maidstone; Stalisfield; Charing
 — *nemoralis*, Linn.
 — *bortensis*, Müll.
Buliminus obscurus (Müll.)
Cochlicopa lubrica (Müll.)
Azeca tridens (Pult.) Local
Cæcilianella acicula (Müll.)
Pupa secale, Drap. Between Dover and Folkestone
 — *cylindracea* (Da C.)
 — *muscorum* (Linn.)
Sphyradium edentulum (Drap.). Keston

MOLLUSCS

- Vertigo minutissima*, Hartm. Maidstone *Planorbis glaber*, Jeff. Thames Marshes ;
(scarce) Paddock Wood
— *substriata* (Jeff.). Westerham ; rejecta- — *nautilus* (Linn.)
menta of river Stour — *carinatus*, Müll.
— *pygmæa* (Drap.) — *marginatus*, Drap.
— *angustior*, Jeff. Ightham — *vortex* (Linn.)
Balea perversa (Linn.). Maidstone (scarce) ; — *spirorbis*, Müll.
Sevenoaks ; Downe — *contortus* (Linn.)
Clausila laminata (Mont.) — *fontanus* (Lightf.)
— *bidentata* (Ström.) — *lineatus* (Walker). Sandwich ; Deal
— *rolphii*, Gray. Local
Succinea putris (Linn.) *Physa fontinalis* (Linn.)
— *elegans*, Risso. Greenhithe ; Deal — *hypnorum* (Linn.). Local

b. BASOMMATOPHORA

- Carychium minimum*, Müll.
Alexia myosotis (Drap.). Erith ; river Stour,
Richborough
Leuconia bidentata (Mont.). Rejectamenta of
river Stour, Richborough
Ancylus fluviatilis, Müll.
Velletia lacustris (Linn.)
Limnæa auricularia (Linn.)
— *pereger* (Müll.)
— *palustris* (Müll.)
— *truncatula* (Müll.)
— *stagnalis* (Linn.)
— *glabra* (Müll.). Erith
Amphipeplea glutinosa (Müll.). Sandwich ;
Deal
Planorbis corneus (Linn.)
— *albus*, Müll.
- Paludetrina confusa* (Frau.). Thames Marshes
(almost, if not quite extinct)
— *jenkinsi* (Smith). Thames Marshes below
Crossness ; rejectamenta of river Stour ;
Hythe (one dead specimen)
— *ventrosa* (Mont.). Erith ; Ramsgate
— *stagnalis* (Bast.). Thames marshes and
dykes around the coast
Bithynia tentaculata (Linn.)
— *leachii* (Shepp.)
Vivipara vivipara (Linn.)
Valvata piscinalis (Müll.)
— *cristata*, Müll.
Assimineæ grayana, Leach. Thames Marshes ;
Sandwich
Pomatias elegans (Müll.)
Acicula lineata (Drap.). Folkestone
Neritina fluviatilis (Linn.). River Medway

II. PROSOBRANCHIATA

B. PELECYPODA

- Unio pictorum* (Linn.)
— *tumidus*, Retz.
Anodonta cygnæa (Linn.)
Sphærium rivicola (Leach)
— *corneum* (Linn.)
— *lacustre* (Müll.)
- Pisidium amnicum* (Müll.)
— *pusillum* (Gmel.)
— *nitidum*, Jenyns. Chislehurst
— *fontinale* (Drap.). Ebbsfleet.
— *milius* (Held.). Keston ; Herne Bay

INSECTS¹

There are few English counties which had a more interesting insect fauna than Kent, and this was doubtless due to its numerous and extensive woods and marshes, to the varied geological formations, its vast extent of coast line and river border and its proximity to the continent.

Until a comparatively recent period probably no county in England produced so many species of insects and so large a number of specimens ; but the advantageous natural conditions of Kent have during the last fifty years been seriously injured by over-cultivation and over-population, the destruction of old woods and by the gradual encroachment, on the north-western portion of the county, of London and its south-eastern suburbs. The very small amount of common and waste lands in the county, as compared with the thousands of acres of forests or woods, heaths and commons in Sussex, Surrey, Hampshire, Dorset, Devon and many other counties, and the extensive acreage devoted to hop gardens, orchards and market gardens, may account for the rarity or entire absence of some species formerly abundant in the county. On the other hand certain species which are common on the continent are more frequently found in Kent than in any other county in England.²

Probably no other English county has been so thoroughly worked for the Lepidoptera (butterflies and moths) ; and the Coleoptera (beetles) have also been most assiduously collected. The Orthoptera (grasshoppers, etc.), the Hymenoptera (bees, wasps and ants) and the Hemiptera (bugs) have not been neglected ; but the Neuroptera (dragonflies, etc.) and Diptera (flies) seem to have received less attention than has been given to these orders in many other counties.

ORTHOPTERA

Earwigs, Grasshoppers, Crickets, Cockroaches, etc.

With the exception of Hampshire, Kent has a longer list of species of this order than any other English county. Altogether thirty-three

¹ The sequence of the orders here followed is that adopted by Dr. D. Sharp, F.R.S., in the *Cambridge Natural History* (1889-92).—H. G.

² I have to express my cordial thanks, for valuable assistance received, to the late Mr. C. G. Barrett, F.E.S. ; the late Mr. A. Beaumont, F.E.S. ; Mr. B. Bower, F.E.S. ; Mr. Malcolm Burr, B.A., F.L.S. ; Mr. E. A. Butler, B.A., B.Sc. ; Mr. Arthur J. Chitty, M.A., F.E.S. ; Mr. Albert B. Farn, F.E.S. ; Mr. Charles Fenn, F.E.S. ; Mr. Hubert Elgar ; the Rev. Canon Fowler, M.A., D.Sc., F.L.S. ; Mr. Edward Goodwin ; the late Colonel Howard L. Irby, F.L.S. ; Mr. William J. Lucas, B.A., F.E.S. ; Dr. H. G. Knaggs, M.D., F.L.S. ; the late Mr. Robert McLachlan, F.R.S. ; Captain Savile G. Reid, R.E., F.Z.S. ; Mr. Edward Saunders, F.R.S. ; Mr. Frederick W. L. Sladen, F.E.S. ; Mr. J. W. Tutt, F.E.S. ; Commander J. J. Walker, R.N., F.L.S. ; Mr. Sydney Webb ; Mr. W. West ; and Colonel John W. Yerbury, R.A., F.Z.S.—H. G.

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species are included, of which twenty-five appear to be indigenous ; five are certainly introduced, and two are irregular or occasional visitors. The more noteworthy Orthoptera from Kent are *Apterygida albipennis*, which has been taken in only one other English county ; *Platycleis ræselii*, a great rarity ; and *Decticus verrucivorus*, one of our scarcest grasshoppers. Further collecting will doubtless show that the Mole Cricket (*Gryllotalpa gryllotalpa*) and the Field Cricket (*Gryllus campestris*), and perhaps also *Mecostethus grossus*, *Ectobia lapponica* and *Platycleis brachyptera*, are to be found within its borders. Some at least of these species may be confidently expected, and it is easily within the bounds of possibility that forms new to the British fauna may be discovered. A few localities, as for instance the Folkestone warren and the Deal sandhills, have been well worked and have produced interesting forms. There are without doubt many other spots in Kent which would equally repay the collector.

FORFICULARIA

Earwigs

The rare earwig *Labidura riparia*, Pall., which is undoubtedly indigenous to Great Britain, has been taken on the beach at Folkestone by a young lady who had 'sufficient observation to see that the insect was a peculiar one, sufficient courage to capture it, and sufficient discrimination to send it to' the Rev. J. G. Wood.¹ *Anisolabis annulipes*, Luc., has been taken at Queenborough and in numbers on the Isle of Sheppey by Com. J. J. Walker, R.N. The Lesser Earwig (*Labia minor*, L.) is frequent in the evening during the early summer, flying often in company with *Staphylinidæ* over dungheaps and flower beds. *Forficula auricularia*, L., the common earwig, is abundant everywhere. *F. lesnei*, Finot, is somewhat locally distributed, but is fairly numerous on shrubs in the Folkestone warren, and may best be taken by sweeping. That rarity, *Apterygida albipennis*, Meg., was captured many years ago by Professor Westwood at Ashford, and recorded by Stephens. Since then it has only been once taken in Britain, i.e. in Norfolk in 1889. *A. arachidis*, Yers., is a cosmopolitan form, and has been taken in numbers in the Chemical Works at Queenborough by Com. J. J. Walker, R.N.

BLATTODEA

Cockroaches

The little cockroach *Ectobia panzeri*, Steph., is by no means rare on the sandhills at Deal. *E. livida*, Fabr., has been taken at Broadwater Forest near Tunbridge Wells by Mr. F. Milton. *Phyllodromia germanica*, L., the 'German Cockroach,' is numerous in many hotels, restaurants, stores, etc. It has been noted at Blackheath and Folkestone. *Blatta orientalis*, L., is of course abundant in most houses. *Periplaneta americana*, L., also occurs in stores and warehouses, especially in seaport towns.

¹ *Insects at Home*, by the Rev. J. G. Wood, p. 230. Mr. Lucas reports the capture of a second specimen in 1902, so the species may now be considered as established as a British insect.—H. G.

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ACRIDIODEA

Grasshoppers

Truxalidæ. *Stenobothrus lineatus*, Panz., is a local form, but abundant in Folkestone warren, and *S. viridulus*, L., is common on grassy places throughout the county. That handsome grasshopper *S. rufipes*, Zett., has been taken at Bromley, Herne Bay and Folkestone warren. *S. bicolor*, Charp., and *S. parallelus*, Zett., are our two most abundant grasshoppers. *S. elegans*, Charp., is abundant on the sandhills at Deal. *Gomphocerus rufus*, L., is by no means common; Com. J. J. Walker, R.N., has taken it at Chatham, and in 1896 it was common at the eastern end of the Folkestone warren, though in 1898 none were to be seen there; it frequents grassy slopes and hillsides exposed to the sun. The little grasshopper *G. maculatus*, Thunb., is common on sandy heaths throughout the county; it has been recorded from Holtye Common, Deal, Folkestone warren, Tunbridge Wells and at Evington near Wye.

Ædipodidæ. It is very doubtful whether the true *Pachytylus migratorius*, L., has ever occurred in this country. It is essentially an eastern or levantine species, and swarms at times in Roumania and south Russia. It has undoubtedly been taken as far west as Sicily, but almost certainly the majority of so-called *P. migratorius* recorded in Britain are to be referred to the following species. It is included here as most of the locusts taken from time to time in Great Britain are recorded as *P. migratorius*, and it is just possible that it may have occurred. The locust *P. danicus*, L. (*cinerascens*, Fabr.), usually reported as *Gryllus migratorius*, has been taken at various times in the county of Kent. In 1846 numbers of locusts were observed at Margate; in 1848 *G. migratorius* was plentiful at Herne Bay and frequent at Margate,¹ and in 1859 was again plentiful at Herne Bay.

Of the *Tettigidæ*, *Tettix subulatus*, L., is widely distributed and common. *T. bipunctatus*, L., is still commoner than the last.

LOCUSTODEA

Grasshoppers

Phaneropteridæ. *Leptophyes punctatissima*, Bosc., has been recorded from Herne Bay, Bromley, New Eltham, Folkestone warren, and from near Strood. It is by no means rare, and probably is widely distributed throughout the county.

Meconemidæ. The delicate little grasshopper *Meconema varium*, Fabr., is commoner than the above; it is most probably common throughout the county, and has been recorded from Bromley and New Eltham.

Conocephalidæ. That handsome grasshopper *Xiphidium dorsale*, Latr., is one of our rarer species; it has been recorded from Herne Bay and

¹ *Rye Ent. W. Int.* (Oct. 3, 1857), iii. 7-8.

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Deal, and should be sought for in marshy places, and may best be taken by sweeping.

Locustidæ. The Great Green Grasshopper (*Locusta viridissima*, L.) is one of our largest British insects. It is common along the south coast, and very numerous at Deal, on the cliffs by Dover, in the warren at Folkestone, and one was recorded from Broadstairs by the Rev. Canon Fowler.

Decticidæ. That widely distributed and by no means uncommon species *Thamnotrixon cinereus*, L., is frequently to be heard chirping on warm autumn evenings in hedges and thickets, especially before rain ; it is very abundant at the Folkestone warren, and occurs also at Edenbridge, at Evington near Wye and near Strood. *Platycleis grisea*, Fabr., is common on open dry places, especially among rest-harrow and on chalky cliffs. It is abundant on the Deal sandhills, on the Dover cliffs, in the warren and on the cliffs at Folkestone. Mr. W. J. Lucas reports the capture of one specimen between Walmer and Dover. *P. ræselii*, Hagenb., is one of our rarest grasshoppers, but has been taken at Herne Bay. The Wart-biter (*Decticus verrucivorus*, Linn.) is one of our finest grasshoppers, but is far from common. A specimen taken at Rochester by Professor Henslow is recorded by Stephens and Curtis, and the species has been twice taken at St. Margaret's Bay. *D. albifrons*, Fabr., a purely meridional form, was taken at Ramsgate in 1850,¹ certainly an accidental occurrence.

GRYLLODEA

Crickets

Gryllidæ. *Gryllus domesticus*, L., the House Cricket, is common in many old houses and in bakeries. The Field Cricket (*G. campestris*, L.) and the Mole Cricket (*Gryllotalpa gryllotalpa*, L.) will probably be discovered in Kent before long, but cannot up to the present be recorded from the county.

NEUROPTERA

Dragonflies, Stone-flies, Lacewings, Caddis-flies, etc.

Although some divisions of the insect fauna (the Lepidoptera, Coleoptera and Hymenoptera, for instance) of the county of Kent have been well worked out, this seems to be far from the case with most of the Neuroptera. The numerous marshes must produce a plentiful caddis-fly (*Trichoptera*) fauna, and probably a number of species of may-flies (*Ephemeridia*), while no doubt the *Planipennia* (lacewings, etc.) would repay working, especially in the hop gardens and orchards. That the minute *Psocidia* have not been sought after is not surprising, and probably owing to the absence of rapid streams the stone-flies (*Perlidia*) are not well represented. Of the distribution of the most conspicuous group,

¹ *Ent. Mo. Mag.* xxx. 236.

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the dragonflies (*Odonata*), on the other hand, we are fairly well acquainted, and of them a useful list, including some fairly good species, can be given ; but even these would repay attention.

Of the *Libellulidæ* nine species have been recorded. *Sympetrum striolatum*, Charp., has occurred at Lee (F. M. B. Carr), Herne Bay (W. H. Bath), Appledore near Ashford (A. Beaumont), Kingsgate (H. A. Sauzé), Ramsgate (C. W. Colthrup), Sandwich (W. J. Lucas), Deal and Dover district (C. G. Hall), Folkestone (H. J. Turner). A male of *S. fonscolombii*, Selys, was taken in 1881 at Deal, and is now, I believe, in the Dover Museum.¹ One specimen of *S. flaveolum*, Linn., was captured (G. T. Porritt) on the sandhills near Deal in August, 1888.² *S. sanguineum*, Müll., seems to be well distributed, at any rate in the east, being noted from Appledore (Beaumont), Horsmonden (R. South), Gravesend (Turner), Sandwich (Lucas), the Deal and Dover district (Hall). *Libellula depressa*, Linn., has been recorded from Folkestone (Porritt) and the Deal and Dover district (Hall) ; *L. quadrimaculata*, Linn., from Kingsdown (Hall) and Dover (Porritt), sandhills, Deal (Carr) ; while in 1900 an immigration of the latter was noticed in the neighbourhood of Margate by H. Stocks and A. J. Mann. The rare *L. fulva*, Müll., has more than once occurred at Deptford,³ Herne Bay,⁴ a female at Kingsdown near Deal in 1881 (Hall), and a rather worn but full-coloured male near Sandwich, 22 August, 1898 (Lucas). *Ortbetrum cærulescens*, Fabr., has been noticed at Chattenden (Turner), and *O. cancellatum*, Linn., formerly occurred at Lee (McLachlan). Turning to the *Æschnidæ*, we have no recent records of *Anax imperator*, Leach, but Evans gives Herne,⁵ and it used to be found at Lee (McLachlan). *Brachytron pratense*, Müll., is recorded for Sandwich, Deal and Dover (Hall), and Herne.⁶ Of the rare *Æschna mixta*, Latr., Kent has produced a good number during the last year or two, localities being Appledore (Beaumont), Ramsgate and Hythe (Colthrup), Deal (R. J. McOnie), Kingsgate (Sauzé), Shoreham (A. A. Buckstone), Folkestone (S. G. Hills). *Æ. cyanea*, Müll., has been recorded for Appledore (Beaumont), Chattenden (Turner), Herne,⁷ Deal and Dover district (Hall), Folkestone (Porritt) ; and *Æ. grandis*, Linn., from Deal and Dover district (Hall).

The last family, *Agrionidæ*, needs more attention, recorded localities being rather scanty. They are : *Lestes sponsa*, Hansem., Appledore (Beaumont), Sandwich (Lucas), Deal (Hall) ; *Platynemis pennipes*, Pall., Sandwich (Carr) ;⁸ *Pyrrhosoma nymphula*, Sulz., Deal and Dover district (Hall), Folkestone (Turner), Sandwich (Carr) ; *Ischnura elegans*, Lind., Appledore (Beaumont), Horsmonden (South), Gravesend marshes (Turner), Sandwich (Lucas), Deal, Dover and Folkestone (Hall) ; *Agrion pulchellum*, Lind., Canterbury, (H. M. Briggs), Ramsgate (Colthrup), Deal (Hall) ; *A. puella*, Linn., Deal and Dover district (Hall), Sandwich (Carr) ; *Enallagma cyathigerum*, Charp., Gravesend marshes (Turner). Of these,

¹ Vide *Ent. Mo. Mag.* xxi. 21 and xxv. 163.

³ Stephens' *Illustrations*, pub. 1836.

⁵ Ibid.

⁶ Ibid.

⁷ Ibid.

² Vide *ibid.* (1889), p. 214.

⁴ Evans, *Brit. Lib.* pub. 1845.

⁸ Ibid.

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although so few localities for them have actually been recorded, no doubt *Sympetrum striolatum*, *Æschna grandis* and *Ischnura elegans* are all over the county, and probably the same may be said of *Libellula depressa*, *Æschna cyanea* and *Agrion puella*.¹

HYMENOPTERA

PHYTOPHAGA

Sawflies, Wood-wasps and Gall-flies

The saw-flies, wood-wasps and gall-flies are chiefly vegetable feeders, but some of the species belonging to the group of gall-flies occur as parasites inside the bodies of other insects.

The larvæ of the sawflies (*Tenthredinidæ*) somewhat resemble the caterpillars of the Lepidoptera; they can however be distinguished from these by the larger number of legs. Most of them feed upon the leaves of various plants and trees, and some of the species are very destructive. Amongst these may be mentioned the Turnip Fly (*Athalia spinarum*, F.), also *Nematus ribesiae*, Scop., which attacks gooseberry and currant bushes and sometimes almost strips them of their foliage. In the *Cephidæ* the larvæ are maggot-like and live inside the stems and buds. *Cephus pygmaeus*, L., inhabits corn-stalks and occasionally injures the crops seriously, but it has not been reported as having done much damage in this country.

The wood-wasps (*Siricidæ*) are the largest insects in this section. The larvæ bore galleries in the wood of fir-trees. The two species of *Sirex* that have occurred in Kent are probably not truly indigenous, but were originally introduced in timber coming from abroad.

Most of the gall-flies (*Cynipidæ*) produce morbid growths or swellings known as galls on the stems, leaves, buds, flowers or roots of the plants on which they feed. A few species do not make galls, but feed on those produced by others.

With regard to the parasitic *Cynipidæ*, these mostly attack the larvæ of certain *Diptera* and *Aphidæ*.

Few entomologists have up to the present interested themselves in this section of the Hymenoptera, consequently the following list is probably far from complete :—

LIST OF KENTISH PHYTOPHAGA

TENTHREDINIDÆ

- Tenthredo livida, L. Maidstone (Frisby),
Darent (Chitty), Ripple (Sladen)
- velox, Fab. Kent (Stephens)
- rufiventris, Pz. Darent (Chitty),
Maidstone (Frisby)
- atra, L. Darent (Stephens)

TENTHREDINIDÆ (continued)

- Tenthredo mandibularis, Pz. Darent
Wood (Stephens)
- maculata, Fourc. Darent (Chitty),
Maidstone (Frisby)
- bicincta, L. Throwley (Chitty), Ripple
(Sladen), Maidstone (Frisby)

¹ Of dragonflies not yet taken *Sympetrum scoticum*, Don.; *Cordulia ænea*, Linn.; *Cordulegaster annulatus*, Latr.; *Æschna juncea*, Linn.; *Calopteryx splendens*, Harr.; *C. virgo*, Linn.; and *Erythromma najas*, Hansem, are almost certainly present; while *Gomphus vulgatissimus*, Linn.; *Lestes dryas*, Kirby; *Pyrrhosoma tenellum*, Vill.; *Ischnura pumilis*, Charp.; and *Agrion mercuriale*, Charp., are not unlikely to be found.

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TENTHREDINIDÆ (continued)

- Tenthredo mesomela*, L. Common
 — *punctulata*, Klug. *Darenth* (Chitty)
Rhogogaster viridis, L. Generally distributed
 — *picta*, Klug. Widely distributed
 — *lateralis*, Fab. *Darenth* and *Throwley* (Chitty)
 — *aucupariæ*, Klug. (= *gibbosa*, Fall.). *Blackbeath* (Beaumont), *Dover* (Sladen), *Maidstone* (Frisby), *Throwley* (Chitty)
Tenthredopsis litterata, Groff.
 var. *cordata*, Fourc. *Lewisham* (Beaumont), *Boxley* (Frisby)
 var. *microcephala*, Lep. *Lewisham* (Beaumont), *Throwley* (Chitty)
 var. *femoralis*, Steph. *Plumstead* (Beaumont), *Dover* (Stephens)
 var. *caliginosa*, Ste. *Blackbeath* (Beaumont), *Throwley* (Chitty)
 — *coqueberti*, Klug. (= *nigricollis*, Cam.). Widely distributed
 — *scutellaris*, Fab. *Dover* (Sladen)
 — *flavomaculata*, Cam. *Plumstead* (Beaumont)
 — *ornata*, Lep. *Throwley* (Chitty)
 — *campestris*, Cam. *Throwley* (Chitty)
 — *dorsivittata*, Cam. *Plumstead* (Beaumont)
 — *inornata*, Cam. *Plumstead* (Beaumont), *Throwley* (Chitty)
 — *nassata*, L. Common
Pachyprotasis rapæ, L. Widely distributed
 — *variegata*, Thoms. *Darenth Wood* (Stephens), *Maidstone* (Frisby)
Macrophya blanda, Fab. *Throwley* (Chitty)
 — *neglecta*, Klug. *Ripple* (Sladen), *Throwley* (Chitty), *Wrotham* (Elgar), *Boxley*, *Barming* (Frisby, etc.)
 — *12-punctata*, L. *Throwley* (Chitty)
 — *albicincta*, Schr. *Plumstead* (Beaumont), *Throwley* (Chitty), *Maidstone* (Frisby)
 — *ribis*, Schr. *Darenth Wood* (Stephens)
 — *rustica*, L. *Boxley* (Frisby)
 — *rufipes*, L. *Plumstead* (Beaumont), *Ripple*, *St. Margaret's Bay* (Sladen); *Darenth*, *Dover* (Stephens)
 — *punctum-album*, L. *Throwley* (Chitty), *Barming* (Frisby)
Allantus scrophulariæ, L. *Throwley* (Chitty), *Folkestone*, *Boxley* (Elgar)
 — *tricinctus*, Fab. *Lewisham* (Beaumont), *Ripple*, *St. Margaret's Bay* (Sladen); *Darenth* (Stephens), *Maidstone* (Frisby)
 — *marginellus*, Fab. *Throwley* (Chitty)
 — *arcuatus*, Forst. Common

TENTHREDINIDÆ (continued)

- Allantus cingulum*, Klug. *Birch Wood* (Smith), *Throwley* (Chitty)
 — *viduus*, Rossi. *Darenth Wood* (E. Newman), *Dover* (C. W. Dale)
Dolerus palmatus, Klug. *Darenth Wood* (Stephens)
 — *pratensis*, Fall. *Blackbeath* (Beaumont)
 — *picipes*, Klug. *Blackbeath* (Beaumont), *Throwley* (Chitty)
 — *triplicatus*, Klug. *Maidstone* (Frisby)
 — *lateritus*, Klug. *Dover* (Sladen)
 — *fulviventris*, Scop. *Maidstone* (Frisby)
 — *palustris*, Klug. *Dover* (Sladen)
 — *gonagra*, F. Common
 — *puncticollis*, Thoms. *Throwley* (Chitty)
 — *liogaster*, Thoms. *Blackbeath* (Beaumont)
 — *hæmatodis*, Schr. *Dover* (Sladen), *Plumstead* (Beaumont)
 — *fissus*, Htg. *Plumstead* (Beaumont), *Throwley* (Chitty), *Dover* (Sladen), *Maidstone* (Frisby)
 — *intermedius*, Cam. *Lewisham* (Beaumont)
 — *niger*, Klug. *Plumstead* (Beaumont), *Throwley* (Chitty)
 — *æneus*, Htg. *Plumstead* (Beaumont), *Throwley* (Chitty)
 — *elongatus*, Thoms. *Lewisham* (Beaumont)
 — *coruscans*, Kon. *Throwley* (Chitty)
Strongylogaster mixtus, Klug. *Blackbeath* (Beaumont)
Selandria serva, F. Common
 — *sixii*, Voll. *Blackbeath* (Beaumont)
 — *stramineipes*, Klug. *Throwley* (Chitty), *Maidstone* (Frisby)
 — *morio*, F. *Throwley* (Chitty)
Taxonus
 — ? *agrorum*, Fall. *Birch Wood* (Stephens)
 — *equiseti*, Fall. *Blackbeath* (Beaumont)
 — *glabratus*, Fall. Widely distributed
Pœcilosoma pulveratum, Retz. *Lewisham* (Beaumont)
 — *guttatum*, Fall. *Lewisham* (Beaumont)
 — ? *submuticum*, Thoms. *Dover* (Sladen)
Eriocampoides annulipes, Thoms. *Chattenden* (Beaumont)
 — *rosæ*, Harris. *Blackbeath* (Beaumont)
Blennocampa albipes, Gmel. } *Lewisham*
 — *ruficrus* } (Beaumont)
 — *ephippium*, Pz. } *Blackbeath*
 — *alchemilliæ*, Cam. } (Beaumont)
 — *subcana*, Zad. }
 — *pusilla*, Klg. } *Lewisham* (Beaumont)
 — *alternipes*, Kl. }
 — *atterrima*, Klug. *Chattenden*, *Dodington* (Chitty)
 — *assimilis*. *Throwley* (Chitty)

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TENTHREDINIDÆ (continued)

- Tomostethus funereus, Klg. *Appledore* (Beaumont)
 Hoplocampa pectoralis, Thoms. *Lewisham* (Beaumont)
 — plagiata, Klg. *Lewisham* (Beaumont)
 — chrysorrhœa, Klg. *Appledore* (Beaumont)
 Emphytus cinctus, L. *Blackheath* (Beaumont), *Boxley* (Frisby), *Chattenden Roughs*, *Throwley* and *Dodington* (Chitty)
 — cingulatus, Lep. *Darent* (Cameron, *Brit. Phyt. Hym.* i. 271), *Throwley*, etc. (Chitty)
 — melanarius, Klug. *Darent Wood* (Stephens)
 — calceatus, Klg. *Blackheath* (Beaumont), *Darent*, *Birch Wood*, *Dover* (Stephens)
 — tibialis, Pz. *Blackheath* (Beaumont)
 — filiformis, Klg. *Darent* (Stephens)
 Phyllotoma vagans, Fall. *Lewisham* (Beaumont)
 Fenusa melanopoda, Cam. }
 — pumila, Klug. } *Lewisham*
 — ulmi, Sund. } (Beaumont)
 — betulæ, Zad. }
 Athalia ancilla, Lep. *Darent*, *Deal* (Chitty); *Lewisham* (Beaumont), *Ripple* (Sladen)
 — spinarum, F. *Lewisham* (Beaumont), *Maidstone* (Frisby)
 — rosæ, L. Common
 — lugens, Klg. *Catford* (Beaumont)
 Dineura stilata, Klug. } *Throwley* (Chitty)
 — verna, Klug. }
 Croesus septentrionalis, L. *Maidstone* (Frisby)
 Cladius pectinicornis, Fourc. Widely distributed
 — viminalis, Fall. } *Lewisham* (Beaumont)
 — rufipes, Lep. }
 — drewseni, Thoms. *Catford* (Beaumont)
 — padi, L. *Throwley* (Chitty), *Blackheath* (Beaumont)
 Nematus myosotidis, F. *Maidstone* (Frisby)
 — ruficornis. *Appledore* (Beaumont), *Ripple* (Sladen)
 — lucidus, Pz. *Darent Wood* (Stephens?)
 — capreæ, Pz. *Lewisham* (Beaumont)
 — turgidus, Zad. *Throwley* (Chitty), *Lewisham* (Beaumont)
 — pallidiventris, Fall. } *Plumstead* (Beaumont)
 — obductus, Htg. } (Beaumont)

TENTHREDINIDÆ (continued)

- Nematus lacteus, Thoms. *Maidstone* (Frisby), *Plumstead* (Beaumont)
 — salicivorus, Cam. *Plumstead* (Beaumont)
 — tibialis, Newm. } *Blackheath* (Beaumont)
 — myosotidis, F. }
 — fruticum, Evers. *Darent Wood* (Stephens)
 — ribesii, Scop. *Blackheath* (Beaumont)
 — gallicola, West. *Plumstead* (Beaumont)
 Pteronus testaceus. *Appledore* (Beaumont)
 Cimbex sylvarum, F. *Maidstone* (Frisby)
 — femorata, L. *Maidstone* (Elgar), *Dartford* (Leach)
 — lutea, L. } *Darent Wood* (Leach)
 — connata, Schr. }
 Trichiosoma scalesii, Leach. *Darent Wood* (Stephens)
 — vittelinæ, L. *Darent Wood* (Leach)
 — lucorum, L. *Ripple* (Sladen), *Barming*, *Maidstone* (Elgar)
 — betuleti, Klug. *Blackheath* (Beaumont), *Maidstone* (Frisby)
 Abia sericea, L. *Maidstone* (Frisby)
 Hylotoma fuscipes, Fall. *Darent Wood* (Stephens)
 — ustulata, L. *Throwley* (Chitty)
 — cyano-crocea, Forst. *Blackheath* (Beaumont), *Throwley* (Chitty)
 Lophyrus pini, L. *Maidstone* (Elgar)
 Pamphilus sylvarum, Ste. *Darent* (Stephens), *Chattenden* (Chitty)
 — betulæ, L. *Birchwood* (Stephens)
 — inanitus, Vill. *Boxley* (Elgar)

CEPHIDÆ

- Cephus femoratus, Curt. *Darent* (Chitty)
 — linearis, Schrank. *Throwley* (Chitty), *Chattenden* (Beaumont)
 — phthisicus, F. *Chattenden* (Beaumont), *Throwley* (Chitty)
 — tabidus, F. *Ripple* (Sladen), *Darent* (Chitty)
 — pygmæus, L. *Throwley* (Chitty), *Ripple* (Sladen), *Maidstone* district (Frisby)
 — pusillus, Ste. *Throwley* (Chitty)

SIRICIDÆ

- Sirex gigas, L. *Maidstone* (Frisby, etc.), *Burham* (Elgar), *Ripple* (Sladen)
 — juvenicus, L. *Maidstone* (Frisby, etc.)

ORYSSIDÆ

- Oryssus abietinus, Scop. *Darent Wood* (Stephens)

CYNIPIDÆ

The following is a list of some oak galls belonging to this family which have been found in Kent by Mr. E. J. Lewis :—

Agamic generation	Time of appearance	Position on tree	Locality	Corresponding sexual generation	Time of appearance	Position on tree	Locality
<i>Neuroterus lenticularis</i> , Ol. . .	July	Under side of leaf	<i>Wye, Edenbridge</i> ; very common	<i>Neuroterus baccarum</i> , L. . .	May	Catkin and leaf	Distributed throughout Kent
— <i>læviusculus</i> , Schenck . . .	July	"	<i>Wye, Edenbridge</i> ; common	— <i>albipes</i> , Schenck . . .	May	Leaf	<i>Wye, Edenbridge</i> ; common
— <i>fumipennis</i> , Htg. . . .	August	"	<i>Wye, Edenbridge</i> ; plentiful	— <i>tricolor</i> , Htg. . . .	June	Leaf and leaf petiole	<i>Wye, Edenbridge</i> ; plentiful
— <i>numismatis</i> , Ol. . . .	July	"	<i>Wye, Edenbridge</i> ; very common	— <i>vesicatrix</i> , Schlecht. . . .	May	Leaf	<i>Wye</i> ; not plentiful
<i>Andricus radicans</i> , Fab. . . .	Sept.	Root	<i>Edenbridge</i> ; not common	— <i>aprilinus</i> , Gir. . . .	April	Bud	<i>Edenbridge</i> ; common
— <i>sieboldi</i> , Htg.	June	Stem	<i>Great Chart</i>	<i>Andricus trilineatus</i> , Htg. . . .	June	Stem	<i>Wye, Edenbridge</i> ; fairly common
— <i>corticis</i> , L.	Sept.	Bud	<i>Edenbridge</i> ; not common	— <i>testaceipes</i> , Htg.	June	Leaf and leaf petiole	Distributed throughout Kent
— <i>globuli</i> , Htg.	Sept.	"	<i>Wye, Edenbridge</i> ; fairly common	— <i>inflator</i> , Htg.	May	Bud	Distributed throughout Kent
— <i>collaris</i> , Htg.	August	"	<i>Wye, Edenbridge</i> ; plentiful	— <i>curvator</i> , Htg.	May	Leaf	
— <i>fecundatrix</i> , Htg.	July	"	Distributed throughout Kent	— <i>nudus</i> , Adler	May	Catkin	<i>Wye</i> ; scarce
— <i>callidoma</i> , Htg.	August	"	<i>Wye, Edenbridge</i> ; common	— <i>ramuli</i> , L.	End of May	"	<i>Wye, Edenbridge</i> ; fairly common
— <i>malpighii</i> , Adler	Sept.	"	<i>Wye</i> ; uncommon				
— <i>autumnalis</i> , Htg.	Sept.	"	<i>Wye</i> ; not very common				
— <i>ostreus</i> , Htg.	July	Leaf (both sides)	Distributed throughout Kent				
— <i>solitarius</i> , Fonsc.	August	Bud	<i>Edenbridge</i> ; uncommon				
— <i>seminationis</i> , Gir.	Sept.	"	<i>Wye</i> ; very local				
— <i>quadrilineatus</i> , Htg.	May	Catkin	<i>Wye, Edenbridge</i> ; abundant				
— <i>albopunctatus</i> , Schlecht.	May	Bud	<i>Wye, Edenbridge</i> ; plentiful				
<i>Biorhiza aptera</i> , Fab.	Sept. onwards	Root	<i>Wye, Edenbridge</i> ; fairly common	<i>Biorhiza terminalis</i> , Fab. . . .	May	Bud	Distributed throughout Kent
<i>Trigonaapis megaptera</i> , Pz. . . .	Sept.	Leaf	<i>Wye, Edenbridge</i> ; common	<i>Trigonaapis crustalis</i> , Htg. . . .	May	Buds on trunk and saplings	<i>Edenbridge</i> ; not common
<i>Dryophanta folii</i> , L.	August	"	Distributed throughout Kent				
— <i>longiventris</i> , Htg.	July and Aug.	"					
— <i>divisa</i> , Adler	July and Aug.	"	<i>Wye</i> ; not common				
<i>Cynips kollari</i> , Htg.	July onwards	Bud	Distributed throughout Kent	<i>Dryophanta verrucosus</i> , Schlecht.	May	Bud	<i>Wye</i> ; scarce

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Mr. Lewis has also found eight galls formed by the following Cynipidæ in Kent :—

Xestophnes potentillæ, Cam.

Rhodites rosæ, Htg.

Aulax glechomæ, Htg.

— eglanteriæ, Htg.

Diastrophus rubri, Htg.

— nervosus, Curt.

ENTOMOPHAGA

Ichneumon-flies, etc.

This is by far the most extensive and perplexing section of the Hymenoptera. It is also the one that has been studied least, and it is safe to say that a large number of the species occurring in Kent have not even been described. This section therefore presents an exceptionally interesting and promising field for entomological research.

The Entomophaga are parasites of the most pronounced kind ; they deposit their eggs inside the bodies of other insects, and the larvæ feed on the living tissues, avoiding the vitals until the fleshy portions have been devoured. For this purpose the female is armed with a sting-like ovipositor, which varies in length. In some of the groups the ovipositor is visible—sometimes it is long—but in others it is concealed.

The Entomophaga prey mostly upon common species of insects. A few of them confine their attacks to single species, but the majority feed on a variety of species, and attack them in the larval stage. It is usual for a number of specimens to inhabit the body of one caterpillar, and the parasites are almost sure to cause death eventually, although cases are on record in which the victim has arrived at the perfect stage. The victims of many of the Entomophaga are destructive to crops, and were it not for the attacks of the parasites the damage they might do would be very great. The ichneumon-flies are therefore of the greatest economic value, and few insects have a more important part to play in maintaining the balance of nature.

The species vary in length from about an inch to less than a millimetre. A large number of the species are exceedingly minute, and can only be properly examined under a powerful lens.

The Entomophaga have been collected to some extent in Kent, and several interesting species have been taken. One or two of these will be mentioned in the following brief notice of each of the main groups.

Ichneumonidæ. This is one of the largest groups, and probably over a thousand species exist in the county, of which only about 300 have been recorded. Relative to those of other groups the majority of the species are large. They are slender insects. Many of them are black with yellow and red markings, and the antennæ and legs are more or less yellow. The large brightly-coloured species chiefly belong to the extensive group of which the genus *Ichneumon*, L., is the type. *Rhyssa persuasoria*, L., has occurred lately near Dover ; it destroys the larvæ of *Sirex gigas*. This ichneumon-fly is nearly an inch in length, and the ovipositor, which is used to drill holes into trees infested with the *Sirex* larvæ, is itself longer than the body.

Braconidæ. This is a moderate-sized group, of which probably over

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200 species occur in Kent, although, as in the case of the Ichneumonidæ, it is very difficult to make an accurate estimate. One of the best known examples of this group is *Apanteles glomeratus*, L., which destroys the larvæ of the common Garden White Butterfly (*Pieris brassicæ*, L.), and its little yellow cocoons may often be seen around the shrivelled skin of its victim. *Agathis malvacearum*, Lat., an interesting and somewhat rare species, has occurred at Appledore and near Dover; it is parasitic on *Parasia lapella*, L. *Blacus armatulus*, Ruthe, has recently been introduced into the British list from a specimen taken at Appledore.

Proctotrypidæ. This group includes some of the very smallest insects, and they are either parasitic on small insects or they infest the eggs of larger ones. Several species have been taken in Kent.

Chalcididæ. A great number of small insects are included in this group. *Brachymeria flavipes*, one of the largest of the common species found in the county, is only a quarter of an inch in length. Several of the species are brilliantly metallic, but their beauties can only be seen under the microscope. Certain species of the genus *Pteromalus* occasionally swarm on the window panes of dwelling houses at some seasons of the year, principally in the autumn.

Evaniidæ. Although the British representatives of this group number only six, it deserves more than passing notice. These insects may be distinguished from all other Hymenoptera by the fact that the abdomen, which is petiolated, springs from the upper or dorsal surface of the thorax, and this gives them a most striking appearance. *Fænus assectator*, L., is a common insect at St. Margaret's Bay, where it probably preys on several species of wasps and bees.

TUBULIFERA

CHRYSIDIDÆ

This little group of brilliantly coloured insects, popularly known as 'Ruby-tailed Flies,' is well represented in Kent. *Cbrysis ignita*, L., is the commonest and at the same time one of the largest and prettiest of the British species, and it may be met with in all parts of the county, hovering in hot sunshine around brick walls and old palings, its metallic blue-green head and thorax contrasting strikingly with the fiery-red abdomen, which shows a greenish-golden tinge in some lights. The other species are not frequently met with.

The *Cbrysididæ* deposit their eggs in the cells of various Aculeata, and the larvæ devour the aculeate larvæ. *Cbrysis ignita*, L., attacks several kinds of wasps and bees; *C. viridula*, L., is to be found especially around the burrows of *Odynerus spinipes*.

The following species have been recorded from Kent :—

Cleptes pallipes, Lep.	Lewisham (Beaumont)	Ellampus auratus, L.	Common
— nitidula, Fab.	Kingsdown, St. Margaret's Bay (Sladen)	— cæruleus, Dahlb. (= violaceus, Scop.).	Lewisham (Beaumont), Bearsted (Elgar)

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Ellampus æneus, Fab. <i>Lewisham</i> (Beaumont)	Chrysis pustulosa, Ab. <i>Maidstone</i> (Elgar)
Hedychridium minutum, Lep. (= ardens, Coq.). <i>Deal, Dover</i> (Sladen); <i>Barming</i> (Elgar)	— viridula, L. (= bidentata, L.). <i>St. Margaret's Bay</i> (Sladen), <i>Bearsted</i> (Elgar)
Chrysis neglecta, Shuck. <i>Maidstone</i> (Elgar), <i>St. Margaret's Bay</i> (Sladen)	— ignita, L. Common everywhere
— cyanea, L. <i>Lewisham</i> (Beaumont), <i>Barming, Herne Bay</i> (Elgar)	— ruddi, Shuck. <i>St. Margaret's Bay</i> (Sladen)

ACULEATA

Ants, Wasps and Bees

This section of the Hymenoptera has been studied in Kent more than any of the others, and the occurrence of 303 species is recorded out of the 384 that have up to the present been taken in Great Britain. These include 16 species of ants (*Heterogyna*), 99 species of sand-wasps (*Fossores*), 18 species of true wasps (*Diploptera*), and 170 species of bees (*Anthophila*).

The habits of the Aculeata are more diverse and interesting than those of any other insects. Most of them live solitarily, each female forming and provisioning her own nest; but in each of the groups except the *Fossores* there are a few species which dwell in colonies, the majority of the occupants of the colonies being workers (imperfect females). The history of the formation and maintenance of these colonies is more like that of a romance than a plain statement of natural facts. Amongst the bees several genera are in a manner parasitic on other bees; they lay their eggs in their nests, so that the young of the parasite feeds upon the pollen that another bee has provided for her own offspring. The name of cuckoo-bees or 'inquilines' has been given to these parasites.

The food of the ants consists chiefly of animal matter, but scarcely anything comes amiss to them; the wasps, solitary and social, prey mostly upon small insects which they catch and give to their young in a living or freshly-killed condition, although many of the adults are fond of honey, etc.; the bees subsist entirely on honey and pollen gathered from flowers.

As many as 8 species of Aculeata have not hitherto been recorded from any place in Britain outside of Kent. These are: *Tachytes lativalvis*, Thoms., *Miscophus maritimus*, Sm., *Cerceris emarginata*, Pz., *Odynerus crassicornis*, Panz., and among the bees *Prosopis punctulatissima*, Sm., *Bombus pomorum*, Panz., *Andrena polita*, Sm., and *Cilissa melanura*, Nyl. The last-named species has only recently been introduced into the British list. Of the others only two species have been taken lately, *Miscophus maritimus*, Sm., which occurs annually at Deal, and *Andrena polita*, Sm.

A considerable amount of collecting has been done at intervals stretching over a good many years in certain spots in the county, but there are several large districts that are still entirely uninvestigated, and these certainly contain many rare and interesting species and probably a few new ones. The sandhills at Deal have long been known as a good

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locality at which many important captures have been made ; the coast between Deal and Dover has also been a favourite collecting ground for some time, the most productive spots on it being Kingsdown and St. Margaret's Bay. Some very good collecting has recently been done in the neighbourhood of Maidstone, and here Oaken Wood near Barming, Ightham Common and Upper Halling have proved to be the best localities.

The late Frederick Smith took several species in various parts of the county which have not been met with since his time. One or two of his insects have however been rediscovered at or near the original locality—some quite lately—and it is probable that a careful search will bring more of them to light. Of those that have recently been rediscovered there are two species that deserve special mention, *Philanthus triangulum*, Fab., and *Andrena polita*, Sm. A single male of the former insect—a very handsome sand-wasp—was taken on the leas at Folkestone 14 August, 1898. The latest previous record of the capture of this insect in Britain was more than thirty years before. This insect is particularly interesting on account of its being the only sand-wasp which has been observed to be bold enough to attack honey-bees for the purpose of provisioning its nest with them. *Andrena polita*, Sm., was taken by Smith probably about fifty years ago in the chalk pits at Northfleet, and there has been no other recorded capture of this rare bee in Britain until a female was taken at Upper Halling in July, 1901.

Sphecodes rubicundus, v. Hag., is an interesting species of bee that was first discovered to be British near Dover in 1895 ; it has however since been taken in one or two places in the east and south of England. The males of almost all the other British species of the genus *Sphecodes* appear in July and August, but those of this species were found flying in May. This and other circumstances pointed to the theory that this species associated with *Andrena labialis* as an inquiline, and the idea has lately gained weight. It is the more interesting because other species of *Sphecodes* are believed to associate with the *Halicti*.

Another bee that calls for special attention is *Bombus smithianus*, White. The variety of this species that occurs in Kent resembles *B. venustus* very closely. It appears to be quite common in Romney Marsh, where the writer has taken the males in abundance at the flowers of the marsh mallow (*Althæa officinalis*).

Andrena lapponica, Zett., was discovered as a new bee to Britain at Ightham near Maidstone in May, 1895. It has however occurred recently in Cumberland and Scotland.

The collectors in the county are much indebted to Mr. Edward Saunders, who has identified a large number of their captures and has done much to arouse and maintain interest in this somewhat neglected order of insects.

It is hoped that the following list may form the basis of a fuller one in later years when our knowledge of the Kentish distribution of these insects is increased.

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HETEROGYNA

FORMICIDÆ

- Formica, L.
 — rufa, L. Common in some districts.
 Near *Maidstone* (Frisby), near *Rochester*
 and *Bredhurst* (Elgar), *Throwley*
 (Chitty)
 — fusca, L. } Generally
 ,, race *cunicularia* } distributed
Lasius, Fab.
 — fuliginosus, Latr. } Generally distributed
 — niger, L. }
 ,, race *alienus*. *Deal Sandhills*, *Dover*
 (Hall)
 — flavus, De Geer. Common
 — umbratus, Nyl. *Throwley* (Chitty)

PONERIDÆ

- Ponera*, Latr.
 — contracta, Latr. Rare. *Deal* (C. W.
 Dale), *Throwley*, *Charing Hill*
 (Chitty)
 — punctatissima, Roger. *Bromley* (Saunders),
 Deal (Hall)

MYRMICIDÆ

- Formicoxenus*, Mayr.
 — nitidulus, Nyl. *Blean Woods* (Chitty)
Myrmecina, Curt.
 — latreillei, Curt. Near *Down* (White),
 Dodington (Chitty)
Tetramorium, Mayr.
 — cæspitum, L. *Throwley* (Chitty), *Deal*,
 Dover (Smith)
Leptothorax, Mayr.
 — acervorum, Fab. *King's Wood* near
 Hollingbourne, 'Goddard's Castle,'
 Thurnham (Frisby); *Wye* (White),
 Throwley (Chitty)
 — tubereum, Fab.
 ,, race *nylanderi*. *Lee* (White),
 Bromley (Saunders)
Stenamma, West.
 — westwoodi, West. Rare. *Maidstone*
 (Frisby), *Tunbridge Wells*, *Deal*,
 Charlton (White)
Myrmica, Latr.
 — rubra, L.
 ,, race *ruginodis* } Generally
 ,, ,, *lævinodis* } distributed
 ,, ,, *scabrinodis* }
Solenopsis, West.
 — fugax, Latr. Rare. *Deal* (Smith)

FOSSORES

MUTILLIDÆ

- Mutilla*, L.
 — europæa, L. Rare. *Darenth*, *Birch*
 Wood (Smith); *Rochester* (Marshall)
 — rufipes, Lat. *Deal* (Saunders, etc.);

MUTILLIDÆ (continued)

- Chatham* (Saunders); *Plumstead*,
Charlton, *St. Margaret's Bay* (Smith)
Myrmosa, Latr.
 — melanocephala, Fab. *Barming* near
 Maidstone (Elgar); *Chatham*, *Herne*
 Bay (Saunders); *Deal* (Smith);
 Kingsdown near *Deal*, *St. Margaret's*
 Bay (Sladen)

TIPHIDÆ

- Tiphia*, Fab.
 — femorata, Fab. *Kingsdown*, *St. Margaret's*
 Bay (Sladen); *Birch Wood*, *Deal*
 (Smith)
 — minuta, V. de Lind. *Ringwould* near
 Dover (Sladen)

SAPYRIDÆ

- Sapyga*, Latr.
 — 5-punctata, Fab. *Bromley* (Saunders),
 Barming (Elgar), near *Dover* (Sladen),
 Throwley (Chitty)

POMPIDIDÆ

- Pompilus*, Fab.
 — unicolor, Spin. *St. Margaret's Bay*
 (Sladen), *Dartford* (Smith)
 — bicolor, Lep. *Upper Halling* (Lamb)
 — rufipes, L. *Deal* (Smith, etc.)
 — plumbeus, Fab. *Deal* (Smith, etc.)
 — niger, Fab. *Maidstone*, *Barming* (Elgar),
 Wychling (Norton)
 — minutulus, Dalhb. *St. Margaret's Bay*
 (Sladen), *Throwley* (Chitty)
 — spissus, Schiödte. *Boxley*, *Barming*
 (Frisby), *Throwley* (Chitty)
 — chalybeatus, Schiödte. *Deal* (Saunders)
 — gibbus, Fab. Generally distributed
 — wesmaeli, Thoms. *Deal* (Saunders)
 — unguicularis, Thoms. *Deal*, *Herne*
 Bay (Saunders), *Throwley* (Chitty)
 — pectinipes, V. de Lind. *Deal* (Saunders,
 etc.), *Sandwich* (Marshall), *St.*
 Margaret's Bay (Sladen), *Throwley*
 (Chitty)

Salix, Fab.

- fuscus, L. Widely distributed
 — affinis, V. de Lind. *Deal*, *Walmer*
 (Smith)
 — exaltatus, Fab. Generally distributed
 — notatulus, Saund. *Erith*, *Darenth*, *Deal*
 (Smith)
 — obtusiventris, Schiödte. *Erith*, *Darenth*
 and *Birch Wood* (Smith), *Dover* (Sladen),
 Upper Halling (Elgar)
 — pusillus, Schiödte. *Herne Bay* (Saunders),
 Throwley (Chitty)
 — parvulus, Dalhb. *Bromley* (Saunders),
 St. Margaret's Bay (Sladen), *Throwley*
 (Chitty)
Calicurgus, Lep.
 — hyalinatus, Fab. *Throwley* (Chitty)

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POMPIDIDÆ (continued)

- Pseudagenia, Kohl.
- carbonaria, Scop. Rare. *Canterbury, Birch Wood, Bexley* (Marshall)
- Agenia, Schiödte
- hircana, Fab. *Boxley* (Frisby)
- variegata, L. *Wychling* (Norton)
- Ceropales, Lat.
- maculata, Fab. *Birch Wood* (Smith), *Throwley* (Chitty)

SPHEGIDÆ

- Astata, Latr.
- stigma, Panz. *Deal* (Smith, etc.)
- Tachytes, Panz.
- unicolor, Panz. Rare. *Deal* (Smith, etc.)
- pectinipes, L. Generally distributed
- lativalvis, Thoms. Very rare. *Deal*, 1882 (Saunders)
- Miscophus, Jur.
- maritimus, Smith. *Deal* (Smith, etc.)
- Trypoxylon, Latr.
- figulus, L. *Maidstone* district (Frisby, etc.), *Herne Bay* (Elgar), *Throwley* (Chitty)
- clavicerum, Lep. *Maidstone* district (Frisby, etc.), *Throwley* (Chitty)
- attenuatum, Smith. *Barming* (Elgar)
- Ammophila, Kirb.
- sabulosa, L. *Barming, King's Wood* near *Maidstone* (Elgar); *Deal* (Smith)
- campestris, Lat. *Wychling* (Norton)
- hirsuta, Scop. *Deal* (Saunders)
- lutaria, Fab. *Deal* (Smith, etc.)
- Spilomena, Shuck.
- troglodytes, V. de Lind. *Charlton* (Smith), *St. Margaret's Bay* (Sladen)
- Stigmus, Jur.
- solskyi, Mor. *Otham* (Frisby, etc.), *Tunbridge Wells* (Saunders)
- Pemphredon, Latr.
- lugubris, Latr. } Common and
- shuckardi, Mor. } generally distributed
- lethifer, Shuck. }
- morio, V. de Lind. *Blackheath* (Beaumont)
- Diodontus, Curt.
- minutus, Fab. Common and generally distributed
- luperus, Shuck. *Deal* (Saunders), *Sandwich* (Marshall)
- tristis, V. de Lind. Generally distributed
- Passalæcus, Shuck.
- corniger, Shuck. *Maidstone* (Frisby, etc.)
- insignis, V. de Lind. *Maidstone* (Frisby, etc.)
- gracilis, Curt. *Maidstone* (Frisby)
- monilicornis, Dhlb. Rare. *Dodington* (Chitty)

SPHEGIDÆ (continued)

- Mimesa, Shuck.
- shuckardi, Wesm. *Boxley* (Frisby)
- bicolor, Fab. *Erith, Deal, Dover* (Smith), *Darent* (Marshall)
- unicolor, V. de Lind. *Charlton* (Smith)
- Psen, Latr.
- pallipes, Panz. Common and generally distributed
- Gorytes, Latr.
- tumidus, Panz. *Deal* (Saunders), *St. Margaret's Bay* (Sladen), *Sandwich* (Marshall), *Boxley* (Frisby)
- mystaceus, L. *Sandling Woods* (Frisby, etc.), *Barming* (Elgar), *Throwley* (Chitty), *Wychling* (Norton)
- quadrifasciatus, Fabr. *Birch Wood* (Shuckard)
- Nysson, Latr.
- spinosus, Fab. *Barming* (Elgar), *Ringwould* (Sladen), *Throwley* (Chitty)
- dimidiatus, Jur. *Kingsdown* (Sladen), *Deal* (Smith)
- Mellinus, Fab.
- arvensis, L. Generally distributed
- Philanthus, Fab.
- triangulum. Rare. *Pegwell Bay* (Smith), *Folkestone* (Freke)
- Cerceris, Latr.
- ornata, Schæff. *Maidstone, Barming, Upper Halling* (Elgar); *Ringwould, St. Margaret's Bay* (Sladen)
- emarginata, Panz. Very rare. *Kingsdown* (Smith)
- quadricincta, Panz. Rare. *Faversham, Canterbury* (Smith); *Tilmanstone* (Sladen); *Upper Halling* (Elgar)
- arenaria, L. *Bearsted* (Frisby), *Maidstone* (Elgar)
- interrupta, Panz. *Birch Wood* (Smith)
- labiata, Fab. *Kingsdown* (Smith), *Ramsgate* (Marshall), *Tilmanstone* (Sladen), *Upper Halling* (Elgar)
- Oxybelus, Latr.
- uniglumis, L. Generally distributed.
- mucronatus, Fabr. Rare. *Deal* (Smith)
- Crabro, Fab.
- tibialis, Fab. Rare. *Sandling Wood, near Maidstone* (Frisby), *Tunbridge Wells* (Saunders)
- clavipes, L. *Maidstone* (Frisby, etc.), *Ringwould* (Sladen)
- leucostomus, L. Common and generally distributed
- pubescens, Shuck. *Dodington, Throwley* (Chitty)
- podagricus, V. de Lind. *Bromley* (Saunders), *Faversham* (Chitty), *Barming* (Lamb)

A HISTORY OF KENT

SPHEGIDÆ (continued)

- Crabro gonager, Lep. Rare. Near *Allington Locks, Maidstone* (Bennett); *Boxley* (Frisby)
 — palmarius, Schreb. *Birch and Darenth Woods* (Smith)
 — palmipes, L. *Maidstone* district (Frisby, etc.), *Darenth* (Chitty)
 — varius, Lep. *Maidstone* (Frisby)
 — anxius, Wesm. *Tunbridge Wells* (Saunders)
 — wesmaeli, V. de Lind. *Barming* (Elgar)
 — elongatulus, V. de Lind. *Boxley, Maidstone* (Frisby, etc.); *Throwley* (Chitty)
 — quadrimaculatus, Dhlb. Widely distributed
 — dimidiatus, Fab. *Maidstone* (Frisby, etc.)
 — vagabundus, Panz. *Maidstone, Barming* (Elgar)
 — cephalotes, Panz. Generally distributed
 — chrysostomus, Lep. *Maidstone* (Frisby, etc.), *Yalding, Upper Halling* (Elgar)
 — vagus, L. *Throwley* (Chitty), *Upper Halling* (Elgar)
 — cribrarius, L. Generally distributed
 — peltarius, Schreb. *Boxley* (Frisby, etc.), *Barming* (Elgar), *Throwley* (Chitty)
 — interruptus, De G. *Darenth* (Smith), *Ringwould* (Sladen), *Maidstone* (Elgar), *Throwley* (Chitty)
 — lituratus, Panz. *Upper Halling* (Elgar), *Dodington, Throwley* (Chitty)
 — albilabris, Fab. Generally distributed
 — panzeri, V. de Lind. *Darenth, Birch Wood* (Smith)
 Entomognathus, Dhlb.
 — brevis, V. de Lind. Common

DIPLOPTERA

EUMENIDÆ

- Odynerus, Latr.
 — spinipes, L. *Throwley* (Chitty), *St. Margaret's Bay* (Sladen)
 — melanocephalus, Gmel. *Betteshanger, St. Margaret's Bay* (Sladen); *Barming, Blean* (Elgar); *Deal* (Smith), *Throwley* (Chitty), *Wychling* (Norton)
 — callosus, Thoms. } Generally distributed
 — parietum, L. }
 — pictus, Curt. *Maidstone* (Frisby, etc.), *Birling* (Elgar), *Ripple, St. Margaret's Bay* (Sladen); *Throwley* (Chitty)
 — trimarginatus, Zett. *Herne Bay* (Saunders), *Deal* (Smith, etc.), *St. Margaret's Bay* (Sladen), *Dungeness, Maidstone* (Elgar); *Throwley* (Chitty)
 — trifasciatus, Oliv. *Upper Halling* (Elgar), *Ripple* (Sladen)
 — parietinus, L. Widely distributed
 — antilope, Panz. *Maidstone* (Frisby)

EUMENIDÆ (continued)

- Odynerus crassicornis, Panz. Very rare. Near *Darenth Wood* (Smith)
 — gracilis, Brullé. *Boxley* (Frisby, etc.), *Barming* (Elgar)
 — sinuatus, Fab. *Wychling* (Norton), *Throwley* (Chitty)
 VESPIDÆ
 Vespa, L.
 — crabro, L. Not common. *Maidstone* (Frisby, etc.)
 — vulgaris, L. } Common and
 — germanica, Fab. } generally distributed
 — rufa, L. }
 — sylvestris, Scop. } Generally distributed
 — norvegica, Fab. *Borough Green* (Frisby), *Maidstone* district (Elgar), *Ringwould* (Sladen), *Sittingbourne* (Chitty)

ANTHOPHILA

COLLETIDÆ

- Prosopis, Fab.
 — cornuta, Sm. Rare. *Throwley* (Chitty), *Kingsdown* (Sladen), *Oaken Wood, Barming, Upper Halling* (Elgar)
 — masoni, Saund. Local. *Walmer* (Saunders, etc.), *Kingsdown, St. Margaret's Bay* (Sladen)
 — dilatata, Kirby. Rare. *Barming, Upper Halling, Folkestone* (Elgar); *Kingsdown* (Sladen), *Throwley* (Chitty)
 — communis, Nyl. Generally distributed
 — signata, Panz. *Kingsdown, St. Margaret's Bay* (Sladen); *Maidstone* (Frisby, etc.), *Throwley* (Chitty)
 — punctulatissima, Smith. Very rare. *Birch Wood* (Smith)
 — hyalinata, Smith. Common
 — confusa, Nyl. *Maidstone* district (Frisby, etc.), *Throwley* (Chitty), *Ripple* (Sladen)
 — brevicornis, Nyl. Generally distributed
 — pictipes, Nyl. *Maidstone* district (Elgar), *Bromley, Herne Bay* (Saunders); *Darenth* (Chitty)

Colletes, Latr.

- succincta, L. *King's Wood* near *Maidstone, Ightham* (Elgar); *St. Margaret's Bay* (Sladen)
 — picistigma, Thoms. *Kingsdown, St. Margaret's Bay* (Sladen); *Yalding, Herne Bay, Upper Halling* (Elgar); *Throwley* (Chitty)
 — marginata, Smith. *Deal* (Smith, etc.), *St. Margaret's Bay* (Elgar)
 — daviesana, Smith. *Maidstone* district, *Folkestone* (Elgar)

ANDRENIDÆ

- Sphecodes, Latr.
 — gibbus, L. Generally distributed

INSECTS

ANDRENIDÆ (continued)

- Sphecodes reticulatus, Thoms. Rare. *St. Margaret's Bay* (Sladen)
- subquadratus, Sm. Common everywhere
- spinulosus, v. Hag. Rare. *Upper Halling* (Elgar), *St. Margaret's Bay* (Sladen)
- rubicundus, v. Hag. Rare. *Ripple*, *St. Margaret's Bay* (Sladen); *Faversham* (Chitty), *Farleigh*, *Upper Halling* (Elgar)
- pilifrons, Thoms. *Faversham* (Chitty), *Maidstone* district, *Hollingbourne* (Frisby, etc.); *Hothfield* (Elgar)
- similis, Wesm. *Dover* district (Sladen), *Canterbury*, *Bromley* (Saunders); *Maidstone* district (Frisby, etc.), *Faversham* (Chitty)
- ferruginatus, Schenck. *Ripple*, *St. Margaret's Bay* (Sladen); *Ightham* (Elgar)
- hyalinatus, Schenck. *Hollingbourne*, *Upper Halling*, *Hothfield* (Elgar)
- puncticeps, Thoms. *Maidstone*, *Upper Halling* (Elgar), *Deal* and *Dover* district (Sladen), *Faversham* (Chitty)
- variegatus, v. Hag. *Herne Bay* (Saunders), *Faversham* (Chitty), *Maidstone* (Elgar), *Deal* and *Dover* district (Sladen)
- dimidiatus, v. Hag. *Maidstone* district (Frisby, etc.)
- affinis, v. Hag. Generally distributed
- Halictus*, Latr.
- rubicundus, Chr. Common everywhere
- quadricinctus, Fab. Local. *St. Margaret's Bay* (Sladen), *Upper Halling* (Elgar)
- maculatus, Sm. Very rare. *Upper Halling* (Elgar)
- xanthopus, Kirb. *Kingsdown* (Smith, etc.), *Dartford* (Perkins), *St. Margaret's Bay* (Sladen), *Lenham*, *Boxley*, *Barming*, *Upper Halling* (Elgar)
- leucozonius, Schrank. Common everywhere
- zonulus, Smith. Generally distributed
- quadrinotatus, Kirb. Generally distributed
- lævigatus, Kirb. *Greenwich*, *Charlton* (Smith); *Upper Halling*, *Snodland* (Elgar)
- cylindricus, Fab. Common everywhere
- albipes, Kirb. Generally distributed
- pauxillus, Schenck. *Throwley* (Chitty)
- subfasciatus, Nyl. Generally distributed
- villosulus, Kirb. Common everywhere
- breviceps, Saund. *Bromley* (Saunders), *Barming*, *Wrotham* (Elgar)

ANDRENIDÆ (continued)

- Halictus punctatissimus*, Schenck. *Deal* (Saunders), *Barming*, *Brasted Chart* (Elgar)
- nitidiusculus, Kirb. Common everywhere
- minutus, Kirb. *Tunbridge Wells* (Saunders), *Bearsted* (Frisby, etc.), *Barming* (Elgar), *Faversham* (Chitty)
- minutissimus, Kirb. Widely distributed
- tumulorum, L. Common everywhere
- smeathmanellus, Kirb. Widely distributed
- morio, Fab. Common everywhere
- leucopus, Kirb. Generally distributed
- Andrena*, Fab.
- albicans, Kirb. Common everywhere
- pilipes, Fab. *Darenth*, *Walmer* (Smith), *Ramsgate* (Marshall), *Dover* (Walker), *St. Margaret's Bay* (Sladen)
- tibialis, Kirb. Generally distributed
- bimaculata, Kirb. *Hothfield* (Lamb), *Dodington* (Chitty)
- rosæ, Panz. (= trimmerana, Kirb.). Common everywhere
- „ var. spinigera. *Hollingbourne*, *Upper Halling* (Elgar); *Faversham* (Chitty), *Ripple* (Sladen), *Tunbridge Wells*, *Canterbury* (Saunders); *Maidstone* (Frisby)
- thoracica, Fab. *Darenth*, *Folkestone* (Chitty); *Wychling* (Norton), *Chatenden* (Elgar), *Ripple*, *Chislet* (Sladen)
- nitida, Fourc. Widely distributed
- cineraria, L. *Dodington* (Chitty), *Mere-worth* (Lamb)
- fulva, Schr. Common
- clarkella, Kirb. *Faversham* (Chitty), *Maidstone* (Frisby, etc.), *Wychling* (Norton)
- nigroænea, Kirb. Common
- gwynana, Kirb. „
- angustior, Kirb. *Boxley* (Frisby, etc.), *Maidstone*, *Barming* (Elgar); *Faversham* (Chitty), *Wychling* (Norton)
- apicata, Smith. *Maidstone* district (Frisby, etc.), *Wychling* (Norton), *Faversham* (Chitty)
- præcox, Scop. *Canterbury* (Saunders), *Boxley* (Frisby, etc.)
- lapponica, Zett. Rare. *Ightham* (Elgar)
- varians, Rossi. *Maidstone* district (Frisby, etc.), *Faversham* (Chitty), *Wychling* (Norton)
- helvola, L. *Ryarsh* (Elgar), *Faversham* (Chitty), *Ripple* (Sladen), *Bromley*, *Tunbridge Wells* (Saunders)
- ambigua, Perk. *Ripple* (Sladen)
- fucata, Sm. *Faversham* (Chitty), *Wychling* (Norton)

A HISTORY OF KENT

ANDRENIDÆ (continued)

- Andrena nigriceps, Kirb. Rare. *Kingsdown* (Smith, etc.)
- simillima, Sm. *Kingsdown* (Smith), *St. Margaret's Bay* (Sladen), *Folkestone* (Elgar)
- fuscipes, Kirb. *King's Wood* near *Hollingbourne* (Frisby, etc.), *Ightham*, *Brasted Chart* (Elgar)
- denticulata, Kirb. *Barming*, *Upper Halling* (Elgar); *Dodington* (Chitty)
- fulvicrus, Kirb. Generally distributed
- fasciata, Nyl. *Canterbury*, *Tunbridge Wells* (Saunders); *Maidstone* district (Frisby, etc.), *Faversham* (Chitty)
- ferox, Sm. Rare. *Dodington*, *Throwley* (Chitty); *Wychling* (Norton)
- hattorfiana, Fab., dark var. Between *Walmer* and *Kingsdown* (Saunders, etc.), *Tilmanstone*, *Ringwould* (Sladen)
- hattorfiana, Fab., red var. *Upper Halling* (Elgar); also at *Erith*, *Darenth*, *Birch Wood* (Smith)
- cetii, Schrank. *Kingsdown* (Smith, etc.), *Dartford* (Smith), *Tilmanstone*, *Ringwould* (Sladen)
- cingulata, Fab. *Boxley*, *Hollingbourne* (Elgar); *Ripple* (Sladen); *Faversham* district (Chitty)
- albicrus, Kirb. Widely distributed
- chrysosceles, Kirb. Widely distributed
- coitana, Kirb. *Faversham* (Chitty), *Kingsdown* (Sladen), *Walmer* (Smith), *Barming* (Frisby, etc.), *King's Wood*, *Luddesdown* (Elgar)
- fulvago, Christ. *Ripple* (Sladen), *Faversham* (Chitty)
- polita, Sm. Very rare. *Northfleet* (Smith), *Upper Halling* (Elgar and Lamb)
- humilis, Imhoff. *Maidstone*, *Barming* (Elgar); *King's Wood* (Frisby), *Tunbridge Wells* (Smith)
- labialis, Kirb. Widely distributed
- niveata, Friese. *Ripple* (Sladen), *Faversham* (Chitty)
- minutula, Kirb. Common
- nana, Kirb. Widely distributed
- proxima, Kirb. *Wrotham*, *Boxley*, *Blue Bell Hill*, *Upper Halling* (Elgar); *Throwley* (Chitty)
- dorsata, Kirb. *Barming*, *Maidstone* (Elgar); *Faversham* (Chitty)
- similis, Sm. *Barming* (Elgar), *King's Wood* near *Hollingbourne* (Frisby), *Wychling* (Norton)
- wilkella, Kirb. Generally distributed
- afzeliella, Kirb. Common
- Cilissa, Leach.
- hæmorrhoidalis, Fab. *Kingsdown* (Smith), *Upper Halling* (Elgar),

ANDRENIDÆ (continued)

- Ewell Minnis*, *St. Margaret's Bay* (Sladen)
- Cilissa melanura, Nyl. Rare. *St. Margaret's Bay* (Sladen), *Upper Halling* (Elgar)
- leporina, Panz. *Deal* and *Dover* district (Sladen), *Herne Bay*, *Hollingbourne*, *Halling* (Elgar); *Faversham* (Chitty), *Gravesend*, *Erith* (Smith)
- Nomada, Fab.
- solidaginis, Panz. Near *Maidstone*, *Hothfield*, *Brasted Chart*, *Upper Halling* (Elgar); *Tilmanstone* (Sladen); *Throwley* (Chitty)
- fucata, Panz. Rare. *Boxley* (Elgar), *Throwley*, *Kingsdown* (Chitty), *Darenth* (Smith)
- succincta, Panz. Common
- lineola, Panz. *Faversham* (Chitty), *Betteshanger* (Sladen), *Maidstone*, *Boxley*, *Bredhurst* (Elgar); *Wychling* (Norton)
- alternata, Kirb. Common
- jacobææ, Panz. *Deal* and *Dover* district (Sladen), *Faversham* (Chitty), *Hothfield* (Elgar)
- alboguttata, H. Schf. Rare. *Farnborough* (Smith)
- ruficornis, L. Common
- „ var. signata, Jur. *Wychling* (Norton), *Ripple* (Sladen)
- bifida, Thoms. *Canterbury* (Saunders), *King's Wood* (Frisby), *Faversham* (Chitty), *Ripple* (Sladen)
- borealis, Zett. *Maidstone* district (Frisby, etc.), *Faversham* (Chitty), *Wychling* (Norton)
- ochrostoma, Kirb. *Faversham* (Chitty), *Maidstone* district (Frisby, etc.), *St. Margaret's Bay*, *Ripple* (Sladen); *Bromley* (Saunders), *Wychling* (Norton)
- armata, H. Schf. Very rare. *Deal* (Smith)
- ferruginata, Kirb. Rare. *King's Wood* (Frisby, etc.), *Farleigh* (Elgar), *Deal* (Smith)
- fabriciana, L. Generally distributed
- flavoguttata, Kirb. *Boxley* (Frisby, etc.), *Wrotham*, *Upper Halling* (Elgar); *Faversham* (Chitty), *Betteshanger* (Sladen)
- furva, Panz. Widely distributed
- Dasypoda, Lat.
- hirtipes, Lat. *Deal* (Smith, etc.), *Hothfield*, *Lydd* (Elgar); *Charlton*, *Paul's Cray* (Smith)
- Panurgus, Panz.
- calcaratus, Scop. *Blackheath* (Smith)
- ursinus, Gmel. *Ramsgate* (Marshall)

INSECTS

APIDÆ

- Epeolus*, Latr.
 — *productus*, Thoms. *Bearsted*, *St. Margaret's Bay* (Elgar), *Charing* (Marshall)
 — *rufipes*, Thoms. *Deal* (Smith, etc.)
Ceratina, Lat.
 — *cyanea*, Kirb. *Boxley*, *Upper Halling* (Elgar); *Folkestone* (Lewis)
Chelostoma, Lat.
 — *florisomne*, L. *Bromley*, *Tunbridge Wells* (Saunders); *Maidstone* district (Frisby, etc.), *Wrotham* (Elgar), *Faversham* (Chitty), *Ripple* (Sladen)
 — *campanularum*, Kirb. *Maidstone* (Frisby, etc.), *Boxley* (Elgar)
Cœlioxys, Lat.
 — *quadridentata*, L. *Maidstone*, *Wrotham*, *Brasted Chart* (Elgar); *Ripple* (Sladen)
 — *rufescens*, Lep. } Widely distributed,
 — *elongata*, Lep. } but not very common
 — *acuminata*, Lep. }
Megachile, Lat.
 — *maritima*, Kirb. Occurs all along the coast. Also at *Upper Halling* (Elgar)
 — *willughbiella*, Kirb. Widely distributed
 — *circumcincta*, Lep. *Folkestone Warren* (Elgar)
 — *ligneseca*, Kirb. *Blackheath* (Saunders), *Maidstone* district, *Chattenden* (Elgar); *Faversham* (Chitty), *Deal* and *Dover* district (Sladen)
 — *centuncularis*, L. Common
 — *versicolor*, Sm. *King's Wood*, *Hothfield* (Elgar); *Faversham* (Chitty), *Wychling* (Norton)
 — *argentata*, Fab. *Deal* (Smith, etc.), *Littlestone* (Elgar), *Ramsgate* (Marshall)
Osmia, Panz.
 — *rufa*, L. Common
 — *pilicornis*, Sm. *King's Wood* near *Maidstone*, *Barming*, *Ryarsb*, *Detling* (Elgar); *Dodington*, *Terry Hill* (Chitty); *Wychling* (Norton)
 — *xanthomelana*, Kirb. Rare. *Darent Wood* (Smith)
 — *cœrulescens*, L. Common
 — *fulviventris*, Panz. Widely distributed
 — *bicolor*, Schrank. On southern slopes of chalk downs near *Maidstone* (Elgar), *Faversham* (Chitty), *Wychling* (Norton), *St. Margaret's Bay* (Sladen)
 — *aurulenta*, Panz. *Deal*, *Kingsdown*, *St. Margaret's Bay* (Sladen); *Folkestone*, *Reculver*, *Wrotham*, *Halling* (Elgar); *Malling* (Frisby), *Herne Bay* (Marshall). Breeds in snail shells.
 — *leucomelana*, Kirb. Not common. *Barming Wrotham*, *Upper Halling*

APIDÆ (continued)

- (Elgar), *Charlton* (Smith), *Kingsdown* (Sladen), *Dodington* (Chitty)
Osmia spinulosa, Kirb. Widely distributed; abundant on the chalk
Stelis, Panz.
 — *aterrima*, Panz. Widely distributed, but not common
 — *phœoptera*, Kirb. Rare. *Allington* (Elgar)
 — *octomaculata*, Sm. Rare. *Wrotham*, *Upper Halling* (Elgar)
Anthidium, Fab.
 — *manicatum*, L. Generally distributed
Eucera, Scop.
 — *longicornis*, L. *Maidstone* district (Frisby, etc.), *Allington*, *Upper Halling* (Elgar), *Wychling* (Norton), *Faversham* (Chitty), *Deal* and *Dover* district (Sladen)
Melecta, Lat.
 — *armata*, Panz. Generally distributed
Anthophora, Lat.
 — *retusa*, L. *Bradhurst* (Frisby), *Monkdown Wood* near *Boxley*, *Lydd* (Elgar), *Betteshanger* (Sladen), *Wychling* (Norton)
 — *pilipes*, Fab. Common everywhere
 — *furcata*, Panz. *Deal* (Saunders, etc.), *Dover* district (Sladen), *Maidstone* district (Frisby, etc.), *Wychling* (Norton)
 — *quadrimaculata*, Panz. *Blackheath* (Saunders), *Upper Halling*, *Burham* at black horehound (Elgar)
Saropoda, Lat.
 — *bimaculata*, Panz. Apparently rare. *Kingsdown* (Sladen)
Psithyrus, Lep.
 — *campestris*, Panz. *Faversham* (Chitty), *Alkham*, *Ringwould* (Sladen); *Maidstone*, *Boxley* (Elgar); *Wychling* (Norton)
 — *barbutellus*, Kirb. *Ripple* (Sladen), *Maidstone* (Frisby)
 — *quadricolor*, Lep. *Barming* (Frisby, etc.), *Ripple* (Sladen)
 — *rupestris*, Fab. Generally distributed
 — *vestalis*, Fourc. Common.
Bombus, Lat.
 — *smithianus*, White. *Dover* (Latter), *Deal*, *Romney Marsh* (Sladen); *Sheppey* (Chitty)
 — *venustus*, Sm. Widely distributed
 — *agrorum*, Fab. Common everywhere
 — *derhamellus*, Kirb. Widely distributed
 — *sylvarum*, L. Common
 — *latreillellus*, Kirb. Widely distributed
 " var. *distinguendus*. *Dymchurch* (Elgar), *Wychling* (Norton)

A HISTORY OF KENT

APIDÆ (continued)

- Bombus hortorum*, L. Common everywhere
 „ race *subterraneus*. Common
 „ „ var. *harrisellus*. Common
 — *jonellus*, Kirb. *Martin* (Sladen), *Wyche*
ling (Norton)
 — *pratorum*, L. Common everywhere

APIDÆ (continued)

- Bombus pomorum*, Panz. Very rare. *Deal*
 (Smith)
 — *lapidarius*, L. } Common everywhere
 — *terrestris*, L. }
 „ race *lucorum*, Sm. Common
Apis, L.
 — *mellifica*, L. Common everywhere

COLEOPTERA

Beetles

There is no county which is richer in Coleoptera than Kent. This is due to its geographical situation and physical features. Within its confines we find nearly all the conditions that are most productive of beetle life—mud flats, salt marshes, brackish ditches with abundant water plants, chalk cliffs, sandhills and stretches of seaweed covered beach, and inland woods and undisturbed park land with plenty of decaying trees; while over and above all these is the luxuriant vegetation and flora of the ‘Garden of England.’ On the north runs the great estuary of the Thames, and from its right bank the deep estuary of the Medway penetrates inland for miles, while from Whitstable to Dunge Ness runs a varied coastline, including some of the best collecting grounds in the kingdom, such as the Isle of Thanet, Pegwell Bay, and the classic localities of Deal sandhills and Folkestone warren. Among inland localities we may mention Birch and Darenth Woods, which have been worked by collectors for more than a century, and which have been as productive of rarities as the New Forest itself. If the New Forest has given us *Anthaxia nitidula*, Darenth Wood has yielded the equally beautiful *Agrilus biguttatus* in numbers; and if the New Forest and surrounding district has produced species not found elsewhere in Britain, Kent can lay claim to the same distinction. We need only mention *Harpalus cordatus*, *Stenolophus elegans*, *Brachida notha*, *Langelandia anophthalma*, *Cis bilamellatus*, *Lixus bicolor*,¹ *Apion lævigatum*, *A. semivittatum* and *Baris scolopacea*, and perhaps we ought to include the brilliant *Rhynchites bacchus*, of which authentic specimens appear to have been taken in Birch Wood at intervals from 1795 onwards, although now it seems to be extinct in Britain.

The extraordinary productiveness of the district around the Medway is shown by Com. J. J. Walker’s list of the Coleoptera of the Rochester district, which only comprises a six-mile radius round Chatham and Rochester. This list contains over sixteen hundred species, or nearly one half of the British Coleoptera. Com. Walker has thoroughly worked the northern part of the county, and he would doubtless have compiled the list of Kentish Coleoptera but for the fact that he is absent on duty in Australian waters. I take this opportunity therefore of acknowledging the use I have made of his valuable catalogue, and also of thanking Mr.

¹ A single specimen of this insect has been recorded from the Portsmouth district, but this may possibly have been in error.—W. W. F.

INSECTS

G. C. Champion for the loan of his exhaustive list of the Coleoptera of Kent and Surrey. I have been much helped by having had full access to the late Dr. Power's collection while writing my work on British Coleoptera, and I have of course included these records in my list, as well as many others contributed by other entomologists, among them being the late Mr. S. Stevens, Mr. R. W. Lloyd, the Rev. T. Wood, Mr. C. G. Hall, the late Mr. W. G. Blatch and the late Mr. A. C. Horner. The last mentioned collector paid especial attention to the small and obscure Staphylinidæ and Clavicornia of Tonbridge and its neighbourhood, and added a considerable number of species to the Kentish fauna. The total result has been a list which comprises the great majority of the British Coleoptera, and which cannot, I feel sure, be beaten by any other county of Great Britain.

Among the Carabidæ, *Carabus auratus*, *Calosoma sycophanta* and *Diachromus germanus* are perhaps the most striking, but they are very doubtfully indigenous. The genera *Dyschirius* and *Harpalus* are particularly well represented, and such insects as *Amara fusca*, *Anchomenus livens*, *Bembidium quaaripustulatum* and *Lebia crux-minor* deserve more than a passing notice.

The best of the Dytiscidæ appear to be *Dytiscus circumflexus* and *Hydaticus seminiger*. Several species of Gyrinidæ are found in the brackish ditches, among them being *G. elongatus* and *G. suffriani*. The Hydrophilidæ are well represented.

It would take too long to enumerate the good species that have occurred among the Staphylinidæ. *Aleochara brunneipennis* has been taken at Frindsbury near Rochester by Com. Walker and also at St. Mary Cray by Dr. Sharp; *Ilyobates propinquus* and *I. forticornis* have occurred at West Wickham and Snodland respectively. About one hundred species of *Homalota* are included in the list, several of them being very rare. *Emus hirtus* has been found on two or three occasions, and the following deserve mention: *Euryporus picipes* (Strood and Faversham), *Quedius longicornis* (Cobham Park), *Staphylinus fulvipes* (Folkestone), *Ocypus cyaneus* (Folkestone), *Philonthus punctus* (Sheerness and Gravesend), *P. fuscus* (Chatham and Cobham Park), *Medon castaneus* (Deal), *M. piceus* (Bexley), *Acrognathus mandibularis* (Tonbridge and Darenth Wood) and *Compsocbilus palpalis* (Sheerness and Tonbridge).

Among the Clavicornia several species of *Anisotoma* and *Colon* are especially noticeable. The very rare *Trichonyx sulcicollis* has been found in one or two localities. *Oxylæmus variolosus* has occurred under bark at Charlton, and one specimen of *Silvanus similis* has been taken by Mr. Walker in a birch faggot in Cobham Park.

Among the Scarabæidæ may be mentioned *Heptaulacus villosus* and *Odontæus mobilicornis*, and also the beautiful and very rare *Gnorimus nobilis*.

Several good Buprestidæ and Elateridæ occur in the county. We have already referred to *Agrilus biguttatus*. All the species of *Trachys* and *Tbroscus* are found, and three or four of the red Elaters. *Ludius ferrugineus* is now apparently extinct, but has occurred at Darenth Wood.

A HISTORY OF KENT

Ischnodes sanguinicollis, *Athous rhombeus* and *Agriotes sordidus* must not be forgotten, and *Melanotus puncto-lineatus* is one of the prizes of the Deal sandhills, and has also been taken at Pegwell Bay and at Dover.

The very rare *Prionocyphon serricornis* has occurred in decaying logs in Darenth and Birch Woods and in Cobham Park, and one pair of *Silis*¹ *ruficollis* has been found at Snodland by Com. Walker. This species is mostly confined to the fenny districts of Cambridgeshire and Norfolk. Mr. Lewis captured one specimen of *Dinoderus substriatus* in Darenth Wood. We have already alluded to the capture of *Cis bilamellatus*. This insect was found in numbers by the Rev. T. Wood in West Wickham Wood, and has not occurred elsewhere.

Several good species of Longicornia are found in the county, the best being perhaps *Hylotrupes bajulus*, *Molorchus umbellatarum* and *Strangalia scutellata*. The latter species, which is not uncommon at times in the New Forest, has been found very rarely in Cobham Park by Com. Walker. Mr. S. Stevens many years ago recorded the capture of the very rare *S. revestita* on flowers in Darenth Wood.

The *Phytophaga* are very well represented. No less than thirteen species of *Cryptocephalus* occur. The very rare *Agelastica alni* has recently been taken at Deal by Mr. Jennings and Mr. Bedwell. Nearly thirty species of *Longitarsus* are found in the county, including *L. agilis*, *L. distinguendus* and other good insects, and Mr. Hall has taken the very rare *Crepidodera nitidula* near Dover. Eleven species of *Cassida* have been recorded, including *C. murræa*, *C. fastuosa*, *C. sanguinolenta*, *C. nobilis* and *C. hemisphærica*.

Among the Heteromera the most notable species are perhaps the following: *Tetratoma desmaresti* and *T. ancora*, *Anisoxya fuscula*, *Osphya bipunctata*, *Oncomera femorata* (this strange insect is nocturnal in its habits and is found on ivy and willows and also comes to 'sugar'), *Mordellistena abdominalis*, *Anaspis melanostoma*, several very rare species of *Meloe* and *Situris muralis*.

Judging from the varied flora of Kent, we should naturally expect the Rhynchophora to be well represented, and such is certainly the case. Many very good bark and decayed wood species also occur, such as *Macrocephalus albinus* and *Tropideres niveirostris*. More than seventy species of *Apion* are found, two of them being peculiar to the county, and most of the other genera occur in much the same proportion. It is hard to particularize, but the following species are worthy of especial notice: *Cænopsis fissirostris* (Chislehurst and Plumstead), *Brachysomus birtus* (Cobham Park and Tonbridge), *Hypera tigrina* (Folkestone), *Procas armillatus* (Darland Hill), *Ceuthorrhynchus syrtes* (Birch Wood and Erith), *C. suturellus* (Hythe, etc.), and *C. pilosellus* (Deal, etc.), *Phytobius quadri-nodosus* (Lee), *Baris scolopacea* (Sheerness), and *Cryphalus fagi* (Westerham and Tonbridge).

¹ In the recently published *List of the Beetles of Ireland*, by the Rev. W. F. Johnson and Mr. J. L. Halbert, this species is recorded as having been taken abundantly on the south bank of the Slaney estuary near Killurin, Wexford, by sweeping herbage close to high water mark.—W. W. F.

INSECTS

CICINDELIDÆ

- Cicindela campestris*, L. Abundant in sandy places
 — *hybrida*, L., var. *maritima*, Dej. Rare. On the coast from *Deal* to *Ramsgate*. There appears to be no record of the capture of *C. sylvatica*, L., in *Kent*, but it probably occurs, as it is locally common in several localities in *Surrey*

CARABIDÆ

- Cychrus rostratus*, L. In moss, at roots of heather, under dead leaves, in rotten wood, etc.; not common. *Chislehurst*, *Hayes*, *Cobham Park*, *Bexley*, *Bredhurst*
Carabus catenulatus, Scop. Widely distributed and generally common. Mr. J. J. Walker, however, records it from the *Rochester* district as 'occasional; *Cobham Park*, under logs'
 — *nemoralis*, Müll. Generally common; recorded however by Mr. Walker as found 'in moss, etc., near *Strood*: rare'
 — *violaceus*, L. Common
 — *auratus*, L. Very rare. *Folkestone*: probably an importation. In 1863 a small colony was found by Dr. Power and Mr. Brewer between *Hythe* and *Sandgate*, but they may have sprung from a batch turned loose by Mr. Walker near *Dover* some years before
 — *monilis*, F. Generally common, but recorded by Mr. Walker as not common in the *Rochester* district var. *consitus*, Panz. Formerly taken at *Beacon Court* near *Brompton*
Calosoma sycophanta, L. Very rare. *Deal*, *Dover*, *Folkestone*, *Herne Bay* and *Gravesend*
 — *inquisitor*, L. On oaks, in woods, sometimes at 'sugar'; very local. *Darenth Wood*
Notiophilus biguttatus, F. Common
 — *substriatus*, Wat. Not so common as the preceding, but generally distributed
 — *quadripunctatus*, Dej. Sandy places. Rare, but probably overlooked. *Tunbridge Wells*, *West Wickham*
 — *aquaticus*, L. Common
 — *palustris*, Duft. „
 — *rufipes*, Curt. Sandy and gravelly places, under dead leaves, etc.; not common. *Gravesend*, *Darenth Wood*, *Cobham Park*, under logs, rare
Leistus spinibarbis, F. Common

CARABIDÆ (continued)

- Leistus fulvibarbis*, Dej. Scarce. *Snodland*, *Higham*, *Cobham Park*, etc.
 — *ferrugineus*, L. Generally distributed
 — *rufescens*, F. Damp places, at roots of grass, in moss, etc.; not common. *Darenth Wood*, *Lewisham*, *Chatten-den*, *Snodland*, etc.
Nebria brevicollis, F. Very common everywhere
Elaphrus cupreus, Duft. Generally distributed and common
 — *riparius*, L. Generally distributed
Loricera pilicornis, F. Very common
Clivina fossor, L. Common
 — *collaris*, Herbst. Not uncommon. *Lee* (G. C. C.), *Snodland*, under old board in a marshy place; rare (J. J. W.)
Dyschirius thoracicus, Rossi. Sandy places on the coast; not common. *Deal*
 — *impunctipennis*, Daws. Sandy places on the coast; rare. *Deal*
 — *politus*, Dej. Sandy and clayey places, inland and maritime; not common. *Sheppey*, *Sheerness*, *West Wickham*, *Deal*
 — *extensus*, Putz. On the coast only; very rare. *Deal* and near *Folkestone*
 — *salinus*, Schaum. Salt marshes on the coast and on the banks of tidal rivers; common. *Rochester* district, *St. Mary's Island*, *Gravesend*, *Sheerness*, *Whitstable*, *Herne Bay*, *Deal*
 — *æneus*, Dej. Sandy banks of ponds and ditches, inland and maritime; not uncommon. *Gravesend*, *Sheerness*, *Snodland*, *Lee*, *Darenth Wood*
 — *globosus*, Herbst. Inland and maritime; local but not uncommon
Broscus cephalotes, L. Widely distributed; omitted however by Mr. Walker from his *Rochester* list
Panagæus crux-major, L. Marshy places; rare. *Shooters Hill*
 — *quadripustulatus*, Sturm. On chalky hillsides and in sandy places; not common. *Cuxton*, *Queendown Warren*, *Down*, *Deal*
Badister unipustulatus, Bon. Not common. *Lewisham*
 — *bipustulatus*, F. Common
 — *sodalis*. Not common. *Darenth Wood*, *Tonbridge*, *Snodland*
 — *peltatus*, Panz. Rare. *Hythe*
Licinus silphoides, F. Not uncommon.
 — *depressus*, Payk. Widely distributed, but much less common than the preceding species

A HISTORY OF KENT

CARABIDÆ (continued)

- Callistus lunatus*, F. Very local. *Canterbury, Folkestone, Dover, Rochester* district (one specimen only), *Queen-down Warren*
- Chlænus vestitus*, Payk. Widely distributed
- *nigricornis*, F. Generally distributed
- Oodes helopioides*, F. Not common.
Banks of *Medway* above *Rochester, Chatham, Tonbridge*
- Stenolophus teutonius*, Schr. Very local.
Greenwich
- *skrimshiranus*, Steph. Not common.
Sheerness
- *elegans*, Dej. Salt marshes; rare.
Banks of *Thames*, towards *Sheerness* and *Sheppey, Sheerness, Deal*
- *vespertinus*, Panz. Local. *Sheerness, Chatham, Lee, Higham*
- Acupalpus flavicollis*, Sturm. Rare.
Higham, Chatham, Deal
- *dorsalis*, F. (*gyllenhali*, Thoms.). Local.
Higham, Chatham, Deal
- *exiguus*, Dej. Very local. *Ramsgate*
" var. *luridus*, Dej. Widely distributed and common
- *meridianus*, L. Very common
- *consputus*, Duft. *Rochester* district, rare; *Lee, Chatham* and *Sheerness*, rather common
- [— *derelictus*, Daws. One specimen recorded as taken by Mr. F. Smith at *Plumstead, Kent*; probably a variety of *A. dorsalis*]
- Bradycellus verbasci*, Duft. Common
- *harpalinus*, Dej. Common
- *similis*, Dej. Widely distributed
- Harpalus sabulicola*, Panz. Very local and rather scarce. *Bredhurst, Gravesend, Folkestone, Deal*
- *rotundicollis*, Fairm. Rather common
- *punctatulus*, Duft. Not common.
Chatham, Dartford, Darland Hill, Folkestone
- *azureus*, F. Locally common
var. *similis*, Dej. With the preceding, but much scarcer. *Bredhurst*
- *cordatus*, Duft. Rare. *Deal*
- *rupicola*, Sturm. Not common. *Sheerness, Deal, Dover, Hythe*
- *puncticollis*, Payk. Common
- *rufibarbis*, F. *Chattenden, Cobham Park*, etc., occasional
- *parallelus*, Dej. Rare. *Rochester* district, *Sheerness*
- *ruficornis*, F. Very common
- *æneus*, F. " "
- *consentaneus*, Dej. Local, but often abundant on the coast; rare inland

CARABIDÆ (continued)

- Harpalus tenebrosus*, Dej. Very rare.
Margate
- *rubripes*, Duft. Rather common
- *discoideus*, F. Very rare. *Gravesend*
- *caspius*, Stev. Not uncommon, but local
- *latus*, L. Generally distributed and common as a rule
- *melancholicus*, Dej. Very rare. *Plumstead*, one specimen taken by myself between *Broadstairs* and *Margate, Deal*
- *tardus*, Panz. Common as a rule; rare in the *Rochester* district
- *servus*, Duft. Rare. *Deal, Romney Sands* and *Covert Wood, Sandwich, Folkestone*; always on or near the coast
- *anxius*, Duft. Locally abundant on the coast
- *serripes*, Schön. Not uncommon on the coast. *Sheerness, Margate, Deal*
- *ignavus*, Duft. Local. *Plumstead, Hythe*
- Dichirotrichus obsoletus*, Dej. Local; salt marshes. *Rainham, Whitstable, Sheerness*
- *pubescens*, Payk. Very common in the salt marshes
- Anisodactylus binotatus*, F. Not uncommon; not recorded, however, from the *Rochester* district
- *pœciloides*. Very local but not uncommon. *Gravesend, Sheppey, Sheerness, Dover, Deal*
- Diachromus germanus*, Er. Very rare and doubtfully indigenous; a few specimens were taken many years ago at *Deal*
- Zabrus gibbus*, F. Very local, but occasionally common in cornfields
- Stomis pumicatus*, Panz. Common
- Platyderus ruficollis*, Marsh. Local. *Blackheath, Tonbridge, Sheerness, Margate, Folkestone*
- Pterostichus cupreus*, L. Very common
- *versicolor*, Sturm. Generally distributed
- *dimidiatus*, Ol. Very rare. *Folkestone*
- *lepidus*, F. Rare. *Dartford* and *Charlton*
- *madidus*, F. Very common
- *niger*, Schall. Common
- *vulgaris*, L. Very common
- *anthracinus*, Ill. Not uncommon.
Tonbridge, Sheerness, Hythe, Dover
- *nigrita*, F. Common
- *minor*, Gyll. "
- *strenuus*, Panz. "
- *diligens*, Sturm. "
- *picimanus*, Duft. Local. *Sheerness, Chattenden*
- *inæqualis*, Marsh. Local. *Tonbridge*
- *vernalis*, Gyll. Common

INSECTS

CARABIDÆ (continued)

- Pterostichus striola*, F. Common
Amara fulva, De G. Locally common; not recorded from the *Rochester* district
 — *apricaria*, Sturm. Common
 — *consularis*, Duft. Local, but has occurred not uncommonly in the north of the county; not recorded from the south
 — *aulica*, Panz. Generally distributed
 — *convexiuscula*, Marsh. Local; not uncommon
 — *patricia*, Duft. Rare. *Burham Downs*, *Queendown Warren*, *Chatham*, *Charlton*, *Plumstead*, *Herne Bay*, *Deal*, *Folkestone*
 — *infima*, Duft. Rare. *Deal*
 — *rufocincta*, Dej. Very local. *Deal*
 — *livida*, F. (*bifrons*, Gyll.). Local. *Rochester* district, *Sheerness*, *Deal*
 — *fusca*, Dej. Very rare. *Plumstead* (W. West)
 — *ovata*, F. Not common. *Darland Hill*, *Bredhurst*, *Chatham*
 — *similata*, Gyll. Common
 — *acuminata*, Payk. Rare. *Cuxton*, *Darland Hill*, *Faversham*, *Chatham*, *Margate*
 — *tibialis*, Payk. Common
 — *lunicollis*, Schödt. Local, but not uncommon
 — *curta*, Dej. Very local. Common on the *Deal* sandhills
 — *spretta*, Dej. Very local. *Deal*
 — *familiaris*, Duft. Very common
 — *lucida*, Duft. Local; rare inland; sometimes abundant on the coast
 — *trivialis*, Gyll. Very common
 — *communis*, Panz. Common
 — *continua*, Thoms. Not uncommon
 — *strenua*, Zimm. Very rare. *Isle of Sheppey* (Dawson); perhaps recorded in error
 — *plebeia*, Gyll. Widely distributed; not common in the *Rochester* district
Calathus cisteloides, Panz. Very common
 — *fuscus*, F. Local, but rather common
 — *flavipes*, Fourc. Local, but not uncommon; not recorded from the *Rochester* district
 — *mollis*, Marsh. Common on the coast from *Whitstable* to *Folkestone*; not recorded from the *Rochester* district
 — *melanocephalus*, L. Very common
 — *piceus*, Marsh. Not uncommon, but very local. *Sevenoaks*, *Blackheath*, *Cobham Park*
Taphria nivalis, Panz. Local and not

CARABIDÆ (continued)

- common. *Halling Downs*, *Blackheath*, *Darent Wood*, *Tonbridge*, *Deal*
Pristonychus terricola, Herbst. Generally distributed and, as a rule, common¹
Sphodrus leucophthalmus, L. Not common; in cellars and outhouses. *Sheerness*, *Greenwich*, *Deal*
Anchomenus angusticollis, F. Common
 — *dorsalis*, Müll. Very common
 — *albipes*, F.
 — *oblongus*, Sturm. "Very local. *Lee*, *Snodland*, *Chattenden*
 — *livens*, Gyll. Rare. *Snodland*, *Westerham*, *Hythe*, *Tunbridge Wells*
 — *marginatus*, L. Very common
 — *sexpunctatus*, L. Doubtfully recorded by Mr. Champion from *Ramsgate*. I know of no other record; it has occurred in several localities in *Surrey*
 — *parumpunctatus*, F. Very common
 — *atratus*, Duft. Local. *Lee*, *Snodland*
 — *viduus*, Panz. Not uncommon
 " var. *mæstus*, Duft. Very common; much more abundant than the type form
 — *versutus*, Gyll. Very local. *Lee*, *Tonbridge*
 — *micans*, Nic. Local. *Strood*
 — *scitulus*, Dej. Rare. *Lee*
 — *fuliginosus*, Panz. Very common
 — *gracilis*, Gyll. Not uncommon, but local. *Lee*, *St. Mary Cray*, *Tunbridge Wells*, *Hythe*
 — *thoreyi*, Dej. Local. *Higham*, *Snodland*
 — *puellus*, Dej. Not common. *Snodland*, in débris of reeds, *Higham*
Olisthopus rotundatus, Payk. Generally distributed
Tachys scutellaris, Germ. Local. *Sheerness*, *Whitstable*
 — *bistriatus*. Local. *Maidstone*, *Tonbridge*
Lymnæum nigropiceum, Marsh. Rare. *Whitstable*, a few specimens
Cillenus lateralis, Sam. Very local. *Sheppey*, *Pegwell Bay*
Bembidium rufescens, Guér. Widely distributed
 — *quinquestriatum*, Gyll. Scarce. *Cobham Park*, *Gillingham*, *Blackheath*, *Tonbridge*, *Deal*

¹ Since this list was in print *Læmostenus complanatus*, Dej., a recent addition to the British fauna, has been recorded by Mr. Champion as having been taken by Com. J. J. Walker, R.N., at Chatham in 1874, and also by Professor Hudson Beare from Strood; it is very closely allied to *Pristonychus terricola*, with which it has been mixed in collections.—W. W. F.

A HISTORY OF KENT

CARABIDÆ (continued)

- Bembidium obtusum*, Sturm. Common
- *guttula*, F. Very common
- *mannerheimi*, Sahl. Local. *Dartford, Maidstone*
- *biguttatum*, F. Very common
- *riparium*, Ol. (iricolor, Bedel.). Local. *Plumstead marshes, Sheerness, St. Mary's Island*
- *æneum*, Germ. Local. *Gravesend, Chatham, banks of Medway above Rochester*; rare (J. J. W.)
- *assimile*, Gyll. Local, but rather common. *Gravesend, Sheerness, Chatham, Snodland, Deal, Hythe*
- *clarki*, Daws. Local. *Higham, Lee, Strood*
- *sturmi*, Panz. Very rare. *Bearsted near Maidstone (Gorham), Hythe, Dover*
- *articulatum*, Panz. Not uncommon
- *doris*, Panz. Locally common. *Cobham, Chattenden, Darent Wood, Strood*
- *minimum*, F. Near the coast; common
- *normannum*, Dej. Near the coast; common
- *gilvipes*, Sturm. Local, but sometimes abundant.
- *lampros*, Herbst. Very common
- *tibiale*. Rare. *Tonbridge*
- *nitidulum*, Marsh. (brunnipes, Sturm.). Common
- *quadriguttatum*, F. Common
- *quadripustulatum*, Dej. Very rare. *Bearsted near Maidstone*; a few specimens taken by Rev. H. S. Gorham
- *quadrinotatum*, Gyll. Common
- *concinnum*, Steph. Locally common
- *femoratum*, Sturm. Common
- *bruxellense*, Wesm. Not common. *Snodland, Gravesend, Maidstone*
- *saxatile*, Gyll. Local. *Dover*
- *littorale*, Ol. Very common
- *bipunctatum*, L. Rare. *Dartford (Stephens)*
- *ephippium*, Marsh. Salt marshes; locally common. *Whitstable, Sheerness*
- *flammatum*, Clairv. Common
- *varium*, Ol. Locally abundant on the coast; rare inland
- *obliquum*, Sturm. Rare. *Maidstone*
- Tachypus flavipes*, Duft. Common
- Trechus micros*, Herbst. Rare. *Darent Wood (Billups)*
- *lapidosus*. Sandy places on the coast; rare. *Deal, Dover, Sheerness*

CARABIDÆ (continued)

- Trechus minutus*, F. Very common
- *obtusus*, Er. Not uncommon
- Patrobis excavatus*, Payk. Not uncommon
- Pogonus luridipennis*, Germ. Salt marshes, on wet mud; local and not common. *Whitstable, Sheerness, Sandwich, Deal, Pegwell Bay*
- *littoralis*, Duft. Salt marshes; local. *Whitstable, Gravesend, Sheerness, Margate, Deal*
- *chalceus*, Marsh. Salt marshes; abundant on the coast and about the mouths of the Thames and Medway
- Masoreus wetterhali*, Gyll. Sandy places on the coast; local. *Deal, Sheerness*
- Cymindis axillaris*, F. Rare. *Halling Downs, Rochester district*; one example under a stone, August, 1897 (J. J. W.)
- Odacantha melanura*, Payk. Rare. *Birchington, Margate*
- Lebia cyanocephala*, L. Rare. *Darent Wood, Dover*
- *chlorocephala*, Hoff. Local. *Rainham, Cuxton, Rochester district, Dartford, Chatham, Folkestone*. Occasionally found in abundance under junipers in winter
- var. *chrysocephala*, Mots. *Rochester district*; rare
- *crux-minor*, L. Very rare. *Plumstead, Tunbridge Wells*
- Demetrias unipunctatus*, Germ. (monostigma, Sam.). Local, but not rare where it occurs. *Deal, Ramsgate, etc.*
- *atricapillus*, L. Very common
- Dromius linearis*, Ol. " "
- *agilis*, F. Rare. *Eltham, Cobham Park, Blackheath, Greenhithe*
- *meridionalis*, L. Common
- *quadrinotatus*, L. Very common
- *quadrinotatus*, Panz. Common
- *quadrinotatus*, Dej. Rare. *Ashford, Maidstone*
- *melanocephalus*, Dej. Very common
- *nigriventris*, Thoms. Local
- *sigma*, Rossi. Rare. *Westerham (Gorham)*
- *vectensis*, Rye. Rare. *Chatham, Gravesend, Sheerness, Rochester, Bexley*
- Blechnus maurus*, Sturm. Common
- Metabletus foveola*, Gyll. Very common
- *truncatellus*, L. Locally common. *Sheerness, Chatham, Deal, Pegwell Bay, etc.*
- *obscurus-guttatus*, Duft. Local, but not uncommon and widely distributed.
- Lionychus quadrillum*, Duft. Rare. *Sheerness, Whitstable*

INSECTS

CARABIDÆ (continued)

- Polystichus vittatus*, Brullé. Local and usually rare. *Whitstable, Herne Bay, Sheerness, Sheppey, Hythe*
Drypta dentata. Very local and rare. *Faversham, Chatham, Chattenden*
Brachinus crepitans, L. Locally common. *Gravesend, Sheerness, Chatham, Whitstable, Folkestone*
 [— *sclopeta*, F. A small series said to have been taken near *Margate* in 1830, but the record is very doubtful]

HALIPLIDÆ

- Brychius elevatus*, Panz. Local. *Maidstone, Bexley*
Haliphus obliquus, Er. Local. *Lee, Deal*
 — *confinis*, Steph. Local. *Lee, Gravesend*
 — *flavicollis*, Sturm. Common
 — *fulvus*, F. Common in most localities; recorded as scarce from the *Rochester* district
 — *variegatus*, Sturm. Rare. *Sheerness, Strood, Rainham, Deal*
 — *cinereus*, Aubé. Rare. *Lee*
 — *ruficollis*, De G. Very common
 — *fluviatilis*, Aubé. Rare. *Chattenden, Snodland, etc.*
 — *lineatocollis*, Marsh. Common
Cnemidotus impressus, F. Local. *Lee, Gravesend, Birchington, Whitstable, Deal*

PELOBIIDÆ

- Pelobius tardus*, F. Widely distributed and not uncommon

DYTISCIDÆ

- Noterus sparsus*, Marsh. Common
Laccophilus interruptus, Panz. Rather common, but apparently scarce in the *Rochester* district
 — *obscurus*, Panz. (*hyalinus*, De G.). Locally common
 — *variegatus*, Germ. Extremely local and usually rare. *Pegwell Bay, Deal, Dover*
Bidessus geminus, F. Very local. *Lee*
Hyphydrus ovatus, L. Common
Cœlambus versicolor, Schall. (*reticulatus*, F.). Very local. *Rainham, Deal*
 — *inæqualis*, F. Common
 — *decoratus*, Gyll. Very local. *Lee*
 — *confluens*, F. Local. *Lewisham, Catford, Upnor*
 — *parallelogrammus*, Ahr. Brackish ditches; common
 — *impressopunctatus*, Schall. (*picipes*, F.). Rather common
Hydroporus pictus, F. Very common
 — *granularis*, L. Not common. *Lee*
 — *flavipes*, Ol. Very local. *Gravesend*
 — *lepidus*, Ol. Local. *Lee*

DYTISCIDÆ (continued)

- Hydroporus dorsalis*, F. Rather common. *Rainham, Chattenden, Lee, Chatham*
 — *lineatus*, F. Rather local
 — *neglectus*, Schaum. Rare. *Lee (Power)*
 — *angustatus*, Sturm. Local. *Lee, Deal*
 — *gyllenhali*, Schiödde. Locally common. *Lee, Darent Wood*
 — *vittula*, Er. Not common. *Lee*
 — *palustris*, L. Very common everywhere
 — *incognitus*, Sharp. *Sheerness*; one example taken by Mr. Champion which must apparently be referred to this species
 — *erythrocephalus*, L. Common
 — *melanarius*, Sturm. Rare. *Esher and Lee Pit (Power)*
 — *memnonius*, Nic. Local. *Darent Wood, Lee, Chattenden*
 — *obscurus*, Sturm. Not common. *Lee*
 — *discretus*, Fairm. Rare. *Lee*
 — *pubescens*, Gyll. (*melanocephalus*, Marsh.). Very common
 — *planus*, F. Common
 — *lituratus*, F. Local. *Gravesend, Chatham, Lee, Chattenden*
Agabus guttatus, Payk. Local. *Greenwich*
 — *biguttatus*, Ol. (*nitidus*, Steph.). Not common. *Maidstone*
 — *paludosus*, F. Local. *Lee*
 — *unguicularis*, Thoms. Local. *Lee*
 — *didymus*, Ol. Local. *Lee, Chattenden*
 — *nebulosus*, Forst. Common
 — *conspersus*, Marsh. Brackish ditches; common
 — *sturmii*, Gyll. Locally common. *Lee, Rainham, Chattenden*
 — *chalconotus*, Panz. Locally common. *Lee, Darent Wood, Chattenden*
 — *bipustulatus*, L. Very common everywhere
 — *Ilybius fuliginosus*, F. Very common
 — *ater*, De G. Locally common
 — *obscurus*, Marsh. Not uncommon. *Lee, Greenwich, Snodland*
Copelatus agilis, F. Not uncommon. *Lee, Rochester district, Deal*
Rhantus grapii, Gyll. Local. *Lee, Birch Wood*
 — *exoletus*, Forst. Local. *Lewisham*
 — *pulverosus*, Steph. *Snodland and Rainham*, scarce; *Lee*, rather common
 — *notatus*, Berg. Not uncommon. *Gravesend, Whitstable, Sheerness, Strood, Chattenden, etc.*
Colymbetes fuscus, L. Very common
Dytiscus punctulatus, F. Rather common
 — *marginalis*, F. Very common
 — *circumflexus*, F. Local and not common. *Woodlands Farm, Chattenden and Lee*

A HISTORY OF KENT

DYTISCIDÆ (continued)

- Hydaticus seminiger*, De G. (hybneri, Fab.).
Very local, but occasionally common. *Lee*
Acilius sulcatus, L. Common

GYRINIDÆ

- Gyrinus elongatus*, Aubé. Rather common. *Rainham, Gravesend, Whitstable, Deal*
— *natator*, Scop. Very common everywhere
— *suffriani*, Scriba. Rare. *Sandwich* (Sharp)
— *marinus*, Gyll. Local; found both inland and near the coast
Orectochilus villosus, Müll. Very local, but not uncommon where it occurs; found in the *Ravensbourne* at *Lewisham*

HYDROPHILIDÆ

- Hydrophilus piceus*, L. Not uncommon where it occurs. *Sheerness, Lee*
Hydrocharis caraboides, L. Common
Hydrobius fuscipes, L. Very common
— *oblongus*, Herbst. Brackish ditches; local. *Rainham, Gravesend, Sheerness, Whitstable, Deal*
Philhydrus testaceus, F. Not uncommon
— *maritimus*. Common near the coast
— *nigricans*, Zett. Not common. *Plumstead, Lee, Gravesend, Greenwich, etc.*
— *melanocephalus*, Ol. Local
— *coarctatus*, Gredl. (suturalis, Sharp). Not uncommon
Cymbiodyta ovalis, Thoms. Common
Enochrus bicolor, Gyll. Local, but not uncommon
Paracymus nigroæneus, Sahl. Not common. *Lee*
Anacæna globulus, Payk. (limbata, Sharp.). Very common
— *limbata*, F. (variabilis, Sharp.). Very common
— *bipustulata*, Steph. Local. *Lee*
Helochares lividus, Forst. Local. *Sheerness*
— *punctatus*, Sharp. Common
Laccobius sinnatus, Mots. (nigriceps, Thoms.). Not uncommon
— *alutaceus*, Thoms. Probably widely distributed. *Ramsgate, Deal*
— *bipunctatus*, F. Locally abundant. *Gravesend, Folkestone, Deal*
[*L. minutus*, L., is usually recorded as abundant in the district, but I believe that *L. bipunctatus*, F., has been confused with it. I have no record of *L. minutus*, L., as Dr. Sharp has determined it, from the London district or the southern counties]

HYDROPHILIDÆ (continued)

- Berosus spinosus*, Stev. Always in brackish ponds and ditches; local. *Sheerness, Sheppey*
— *signaticollis*, Sharp. Local. *Lee, Whitstable*
— *luridus*, L. Local. *Lee, Rainham, Deal*
— *affinis*, Brullé. Common
Limnebius truncatellus, Thoms. Not uncommon
— *papposus*, Muls. Not uncommon
— *nitidus*, Marsh. Local
Chætarthria seminulum, Herbst. Common
Helophorus rugosus, Ol. Not uncommon
— *nubilus*, F. Common
— *intermedius*, Muls. Occasionally common
— *aquaticus*, L. Very common everywhere
var. *acqualis*, Thoms. With the type; occasional
— *dorsalis*, Marsh. Rare. *Chattenden*
— *æneipennis*, Thoms. Common
— *mulsanti*, Rye. Not uncommon. *Lee, Chatham, Rainham, Darent Wood*
— *affinis*, Marsh. Generally common
— *brevipalpis*, Bedel. Not uncommon
— *nanus*, Sturm. Very local. *Lee* (Power)
Hydrochus elongatus, Schall. Not uncommon
— *angustatus*, Germ. Common
Octhebius exaratus, Muls. Chiefly in brackish ditches; very local. *Rainham, Gravesend, Whitstable*
— *margipallens*, Latr. Chiefly in brackish ditches; locally abundant
— *marinus*, Payk. Brackish ditches; common near the sea
— *pygmæus*, F. Inland and maritime; rather common
— *bicolon*, Germ. Inland and maritime; rather common
— *auriculatus*, Rey. Locally common; *Isle of Sheppey*
— *rufimarginatus*, Steph. Inland and maritime; not common. *Sheerness, Strood, Maidstone*
— *nanus*, Steph. (ætatus, Steph.). Inland and maritime; local
— *punctatus*, Steph. Very local near the sea. *Sheerness, Pegwell Bay*
Hydræna testacea, Curt. Scarce. *Lee*
— *riparia*, Kug. Not common. *Chatham* and *Rochester* district
Cyclonotum orbiculare, F. Common
Sphæridium scarabæoides, F. Very common everywhere

INSECTS

HYDROPHILIDÆ (continued)

- Sphæridium bipustulatum*, F. Very common
 var. *marginatum*, F. Not uncommon
Cercyon littoralis, Gyll. Abundant all along the coast, on the shore
 — *depressus*, Steph. Not uncommon with the preceding
 — *hæmorrhous*, Gyll. Local. *Snodland, Sheerness*
 — *hæmorrhoidalis*, Herbst. Common
 — *obsoletus*, Gyll. Local, and as a rule not common
 — *aquaticus*, Muls. Scarce. *Sheppey, Sheerness*
 — *flavipes*, F. Common
 — *lateralis*, Marsh. Local. *Darenth Wood, Blue Bell Hill, Strood, Lee*
 — *melanocephalus*, L. Very common
 — *unipunctatus*, L. Common
 — *quisquilius*, L. "
 — *nigriceps*, Marsh. Not common. *Greenwich, Rochester district*
 — *pygmæus*, Ill. Not uncommon
 — *terminatus*, Marsh. Local and not common. *Whitstable, Cobham, Greenwich*
 — *analis*, Payk. Common
 — *lugubris*, Payk. Local. *Lee, Sheerness*
 — *minutus*, Muls. Not common. *Blackheath*
Megasternum boletophagum, Marsh. Common
Cryptopleurum atomarium, Muls. Common

STAPHYLINIDÆ

- Homœusa acuminata*, Märk. In the runs of *Formica fuliginosa* and *F. fusca*. Rare. *Cobtham, Upnor, Bromley, Tonbridge*
Aleochara ruficornis, Grav. Near nests of *Formica rufa* and *F. fusca*. Very rare. *Charlton*
 — *fuscipes*, F. Very common everywhere
 — *lata*, Grav. Much less common than the preceding
 — *brevipennis*, Grav. Rare. *Whitstable, Snodland*
 — *tristis*, Grav. Common
 — *bipunctata*, Ol. Generally distributed, and as a rule common
 — *cuniculorum*, Kr. Rare. *Maidstone, West Wickham, Birch Wood, Darenth Wood, Bearsted*
 — *lanuginosa*, Grav. Very common
 — *lygæa*, Kr. Rare. *Eltham, Tonbridge*
 — *mœsta*, Grav. Common
 — *mycetophaga*, Kr. Rare. *Birch Wood*
 — *mærens*, Gyll. Rare. *Sheerness, Birch Wood*

STAPHYLINIDÆ (continued)

- Aleochara brunneipennis*, Kr. Very rare : *Frindsbury near Rochester (J. J. W.) ; St. Mary Cray (Sharp)*
 — *nitida*, Grav. Very common
 var. *bilineata*, Gyll. Not nearly as common as the type form
 — *morian*, Grav. Common
 — *grisca*, Kr. Not uncommon on the shore in decaying seaweed. *Herne Bay, Whitstable, Broadstairs*
 — *algarum*, Fauv. Rather common in decaying seaweed
 — *obscura*, Er. Not uncommon in decaying seaweed. *Sheerness, Margate*
Microglossa suturalis, Sahl. Common
 — *pulla*, Gyll. In holes of the sand martin ; not uncommon, but local
 — *nidicola*, Fairm. In holes of the sand martin, etc. ; not uncommon. *Chislehurst, Sevenoaks, Sheerness*
Oxypoda spectabilis, Märk. Rare. *Wigmore Wood, New Brompton, Darenth Wood*
 — *lividipennis*, Mann.¹ Common
 — *opaca*, Grav. Common
 — *alternans*, Grav. Very common in decaying fungi
 — *exoleta*, Er. Rare. *Gravesend, Sheerness, Tonbridge*
 — *lentula*, Er. Locally common. *Lee, Darenth, Eltham, Tonbridge, etc.*
 — *umbrata*, Gyll. Common
 — *pectita*, Sharp. Not common. *Eltham, Tonbridge*
 — *nigrina*, Wat. Local
 — *exigua*, Er. Rare. *Deal*
 — *longiuscula*, Er. Common
 — *formiceticola*, Märk. Common in nests of *Formica rufa*
 — *hæmorrhœa*, Mann. Common ; often in nests of *Formica rufa*
 — *amoena*, Fairm. Very rare. *Eltham*
 — *waterhousei*, Rye. Rare. *Sheerness*
 — *annularis*, Sahl., var. *pallidula*, Mann. Scarce. *Tonbridge*
 — *brachyptera*, Steph. *Cobham Park (G. C. C.)*
 — *misella*, Kr. Rare. *Wickham*
Thiasophila angulata, Er. In nests of *Formica rufa* ; common
 — *inquilina*, Märk. In nests of *Formica fuliginosa* ; rare. *Charlton, Darenth, Maidstone*

¹ I have omitted *O. vittata*, Märk., as I can find no actual record for Kent, but it is sure to occur, as it is locally common in Surrey and the London district generally, in nests of *Formica fuliginosa*.—W. W. F.

A HISTORY OF KENT

STAPHYLINIDÆ (continued)

- Ischnoglossa prolixa*, Grav. (rufopicea, Kr.).
Local. *Chatham, Cobham Park, Darent Wood, Tonbridge*
— *corticina*, Er. Rare. *Bromley*
Ocyusa incrassata, Kr. Rare. *Sheerness, Cobham Park*
— *maura*, Er. Common
— *picina*, Aubé. Rare. *Maidstone, Bearsted, Tonbridge*
Phlæopora reptans, Grav. Under bark ; not common
Ocalea castanea, Er. Rare. *Cobham Park*
— *latipennis*, Sharp. Rare. *Tonbridge*
— *badia*, Er. Usually common. *Rochester district, scarce*
Ilyobates nigricollis, Payk. Rare. *Snodland, Birch Wood, Folkestone*
— *propinquus*, Aubé. Very rare. *West Wickham*
— *forticornis*, Lac. Very rare. *Snodland, one specimen*
Calodera riparia, Er. Rare. *Shooters Hill, Tonbridge*
— *æthiops*, Grav. Local. *Darent Wood, Lee, Gravesend, Sheerness*
— *rubens*, Er. Very local ; occasionally found in abundance in flood refuse in early spring. *Lee (Power)*
— *umbrosa*, Er. Not common. *Darland Hill, Bromley, Darent, Chatham, Charlton, Deal*
Chilopora longitarsis, Er. Common
Dinarda märkeli, Kies. In nests of *Formica rufa* ; not uncommon
Atemeles emarginatus, Grav. In nests of *Formica fusca*, *Myrmica scabrinodis*, *M. ruginodis* and *M. lævinodis*. Not uncommon
— *paradoxus*, Grav. In nests of *Myrmica lævinodis* and *Formica fusca*. Very rare. *Charlton, Folkestone*
Myrmedonia limbata, Payk. In association with *Formica flava*, *F. fusca* and *F. fuliginosa* ; not uncommon¹
— *humeralis*, Grav. In nests of *Formica rufa* ; rather common
— *cognata*, Märk. In nests of *Formica fuliginosa* ; scarce. *Tonbridge*
— *laticollis*, Märk. In nests of *Formica fuliginosa*. Locally common. *Chatham, Upnor*
Astilbus canaliculatus, F. Very common everywhere

¹ I cannot find an actual Kent record for *Myrmedonia funesta*, Grav., but it almost certainly occurs in the nests of *Formica fuliginosa*, as it is common in Surrey and the London district generally. *M. lugens*, Grav., also probably occurs in Kent.—W. W. F.

STAPHYLINIDÆ (continued)

- Callicerus obscurus*, Grav. Local, but widely distributed
— *rigidicornis*, Er. Rare. *Chatham, Cobham Park, Upnor, Lewisham, Esher, etc.*
Thamiaræa cinnamomea, Er. At the exuding frass of *Cossus* infected trees. Local. *Sittingbourne, Cobham Park*
— *hospita*, Er. At frass as the preceding. Local. *Sheerness, Sittingbourne, Cobham Park*
Notothecta flavipes, Grav. In nests of *Formica rufa*. Common
— *confusa*, Märk. In nests of *Formica fuliginosa*. Rare. *Charlton*
— *anceps*, Er. In nests of *Formica rufa*. Common
Alianta incana, Er. Local, but widely distributed
— *plumbea*, Wat. On the coast ; locally common. *Dover, Folkestone*
Homalota planifrons, Wat. Very rare. *Charlton Pit*
— *gregaria*, Er. Very common
— *eximia*, Sharp. Very rare. *Tonbridge (Horner)*
— *longula*, Heer. Rare. *Tonbridge*
— *littorea*, Sharp. On the coast ; local. *Sheerness, Deal*
— *imbecilla*, Wat. On or near the coast ; local
— *luteipes*, Er. Rare. *Sheerness, Tonbridge*
— *luridipennis*, Mann. Local. *Chatham, Darland Hill*
— *gyllenhali*, Thoms (*londinensis*, Sharp). Local. *Lee*
— *hygrotopora*, Kr. Local. *Tonbridge*
— *elongatula*, Grav. Very common
— *volans*, Scriba. Common
— *vestita*, Grav. Abundant on the coast
— *silvicola*, Fuss. Rare. *Bexley, Darent Wood, Esher, Tonbridge*
— *vicina*, Steph. Very common
— *pagana*, Er. Local and not common. *Cobham Park, Darent, Tonbridge*
— *graminicola*, Gyll. Common
— *halobrectha*, Sharp. On or near the coast ; not uncommon
— *algæ*, Hardy (*puncticeps*, Thoms.). On the coast ; not uncommon
— *oculta*, Er. Rare ; *Gravesend*
— *fungivora*, Thoms. Not uncommon
— *nigella*, Er. Not uncommon. *Lee, Sheerness, Strood*
— *æquata*, Er. Rather common under bark of various trees
— *angustula*, Gyll. Locally common

INSECTS

STAPHYLINIDÆ (continued)

- Homalota linearis, Grav. Under bark and in moss on trunks; locally common
- debilis, Er. Local. *Lee, Darenth Wood, Tonbridge*
- fallaciosa, Sharp. Rare. *Lee*
- deformis, Kr. Rare. *Eltham, Tonbridge Wells*
- cæsula, Er. Rare. *Sheerness, Deal*
- circellaris, Grav. Very common everywhere
- elegantula, Bris. Rare. *Chatham, Sheerness, Wigmore Wood*
- splendens, Kr. Very rare. *Lee, Charlton, Tonbridge*
- immersa, Er. Not common. *Cobham, Sevenoaks, Tonbridge*
- cuspidata, Er. Under bark; local. *Cobham Park*
- gemina, Er. Rare. *Lee*
- vilis, Er. Very rare. *Eltham (Sharp), Lee (Champion), Tonbridge (Horner)*
- laticeps, Thoms. (difficilis, Bris.). Very rare. *Lee (Champion)*
- analis, Grav. Abundant everywhere
- decipiens, Sharp. Rare. *Lee, Chatham, Charlton, Tonbridge*
- soror, Kr. Rare. *Lee, Tonbridge*
- exilis, Er. Very local. *Lee, Highbam, Tonbridge*
- palicola, Er. Rare. *Wigmore Wood, Birch Wood, Darenth Wood, Chatham*
- depressa, Gyll. Widely distributed and not uncommon
- hepatica, Er. Widely distributed, but always rare. *Cobham Park, Wigmore Wood, Greenhithe, Chatham, St. Mary Cray, Darenth Wood*
- aquatica, Thoms. Local. *Chatham, Lee, Highbam, Sevenoaks, Darenth Wood*
- æneicollis, Sharp. Widely distributed and not uncommon
- xanthoptera, Steph. Common
- euryptera, Steph. (succicola, Thoms.). Rather common
- trinitata, Kr. Very common everywhere
- xanthopus, Thoms. Rare. *Cobham, Charlton, St. Mary Cray, Hythe*
- triangulum, Kr. Widely distributed
- fungicola, Thoms. Common everywhere
- ignobilis, Sharp. Rare. *Lee, Sevenoaks, St. Mary Cray, Darenth Wood, Tonbridge*
- boletobia, Thoms. Not uncommon
- liturata, Steph. *Tonbridge (Horner)*

STAPHYLINIDÆ (continued)

- Homalota coriaria, Kr. Not common. *Darenth and West Wickham Woods, Sittingbourne*
- sodalis, Er. Local. *Darenth Wood, Chatham, Rochester district*
- clancula, Er. (atrata, Kr.) Very rare. *Lee (Champion)*
- gagatina, Baudi. Generally distributed
- divisa, Märk. Rare. *Darenth Wood, St. Mary Cray, Gravesend, Tonbridge, Deal*
- nigricornis, Thoms. Local. *Darenth Wood, Tonbridge*
- ravilla, Er. *Chatham, Rochester district, Bexley*
- palustris, Kies. Not uncommon
- corvina, Thoms. Very local. *Tonbridge*
- perexigua, Sharp. Very rare. *Sheerness (J. J. W.), Tonbridge (Horner)*
- scapularis, Sahlb. Not common. *Darenth Wood, Chattenden, Strood, Chatham, Folkestone*
- testaceipes, Heer. Rare. *Chatham, Faversham, Wigmore Wood*
- oblita, Er. Local, but occasionally common. *Darenth Wood, Chatham, Sheerness, Deal, Tonbridge*
- autumnalis, Er. At the exuding sap of Cossus infected trees; also under bark; rare. *Hawkburst, Tonbridge*
- sericea, Muls. Common
- indubia, Sharp. Rare. *Sheerness, Birch Wood, Tonbridge*
- mortuorum, Thoms. Rare. *Birch Wood*; perhaps recorded in error
- atricolor, Sharp. Rather common, but local
- inquinula, Grav. Local, but not uncommon
- nigra, Kr. Very common everywhere
- germana, Sharp. Not common. *Lee, Chatham*
- celata, Er. Rare. *Darenth Wood*
- sordidula, Er. Not uncommon
- canescens, Sharp. Local and not common; perhaps overlooked. *Lee, Eltham, Tonbridge*
- cauta, Er. (parva, Sahlb.?). Common
- villosula, Kr. Not common. *Lee, Darenth Wood, Upnor, Chatham, Tonbridge*
- setigera, Sharp. Scarce. *Tonbridge*
- lævana, Muls. Rare. *Bexley, Tonbridge*
- cinnamoptera, Thoms. Rare. *Sheerness, Tonbridge*
- atramentaria, Gyll. Very common everywhere

A HISTORY OF KENT

STAPHYLINIDÆ (continued)

- Homalota marcida, Er. Local, but often found in abundance in fungi, leaves, etc., in the autumn
- intermedia, Thoms. Not common. *Bexley, Tonbridge*
- longicornis, Grav. Common everywhere
- sordida, Marsh. (melanaria, Thoms.). Very common everywhere
- testudinea, Er. Locally common
- aterrima, Grav. Common as a rule
- pygmæa, Grav. Local. *Lee, Chatham, Sheerness, Tonbridge*
- muscorum, Bris. Widely distributed
- pilosiventris, Thoms. Rare. *Birch Wood, Lee, Tonbridge, Deal*
- laticollis, Steph. (fusca, Sahl.). Common
- subsinuata, Er. Not common. *Birch Wood*
- montivagans, Woll. (pulchra, Kr.). Rare. *Sheerness, Charlton*
- orbata, Er. On the coast; rare. *Whitstable, Deal*
- fungi, Grav. Very common everywhere
- var. clientula, Er. Rather common
- orphana, Er. Rare. *Sheerness, Sheppey*
- Gnypeta labilis, Er. Common
- Tachyusa constricta, Er. Very local. *Tonbridge*
- scitula, Er. Rare. *West Wickham*
- flavitarsis, Sahl. Local. *Lee, Tonbridge, Bearsted*
- umbratica, Er. Local. *Lee, Tonbridge*
- atra, Grav. Local. *Lee, Sheerness, Deal*
- concolor, Er. Rare. *Lee, Eltham*
- Myrmecopora uvida, Er. On the coast; local. *Whitstable, Rochester, Sheerness, Hythe*
- sulcata, Kies. On the coast; local. *Whitstable, Rochester*
- Falagria sulcata, Payk. Very common
- sulcatula, Grav. Local. *Chatham, Sheerness, Deal*
- thoracica, Curt. Not common. *Birch Wood, St. Peter's (Isle of Thanet), Dover*
- obscura, Grav. Common
- Autalia impressa, Ol. Generally distributed and common
- rivularis, Grav. Local; not uncommon
- Encephalus complicans, Westw. Not uncommon. *Upnor, Lee, Chatham, Sheerness*
- Brachida notha, Er. Very rare. Only taken in Britain in two localities in Kent, viz. *Chatham* district, banks of

STAPHYLINIDÆ (continued)

- Medway at Rainham* (Sharp and Brewer), *Folkestone* (Rye)
- Gyrophæna pulchella, Heer. Rare. *West Wickham*
- affinis, Mann. Common
- gentilis, Er. Not rare
- nana, Payk. Not common. *Tonbridge*
- fasciata, Marsh. (congrua, Er.). Rather common
- minima, Er. Occasionally abundant, but local. *Birch Wood, Chatham*
- lævipennis, Kr. Very local, but abundant where it occurs. *Snodland, Tonbridge*
- lucidula, Er. Very local. *Lee, Eltham, Snodland*
- strictula, Er. Very local: *Maidstone, Darent Wood*
- Agaricochara lævicollis, Kr. Very local. *Chatham*
- Placusa pumilio, Er. Not uncommon. *Lee, Tonbridge*
- infima, Er. Rare. *West Wickham*
- Epipeda plana, Gyll. Local. *Sheerness, Chatham*
- Silusa rubiginosa, Er. At the exuding sap of the small black poplar infected with the larva of Cossus; rare. *Chatham Dockyard, Tonbridge*
- Leptusa fumida, Er. Very common
- Sipalia ruficollis, Er. Local. *Westerham, Cobham Park*
- testacea, Bris. One specimen taken by Mr. Champion at *Whitstable*, 6 June, 1870, which was unique as British for many years until Mr. Blatch found the species at *Weymouth*
- Bolitochara lucida, Grav. Not uncommon
- lunulata, Payk. Rare. *Cobham Park*
- bella, Märk. (lunulata, Muls. et Rey.). Local, but not uncommon, and sometimes in great abundance
- Phytosus spinifer, Curt. On the shore below high-water mark; not common. *Margate, Broadstairs*
- Diglossa mersa, Hal. Under shingle below high-water mark; rare. *Sheerness*
- Hygronoma dimidiata, Grav. Local, but common
- Oligota inflata, Mann. Not uncommon
- pusillima, Grav. Generally common
- atomaria, Er. Rare. *Charlton, Tonbridge, Deal*
- punctulata, Heer. (ruficornis, Sharp). Very common
- apicata, Er. Rare. *Cobham, Bexley*
- Myllæna dubia, Grav. Local. *Lee, Cobham, Strood, Tonbridge*

INSECTS

STAPHYLINIDÆ (continued)

- Myllæna intermedia*, Er. Common
 — *minuta*, Grav. Local. *Strood, Sheerness, Lee*
 — *elongata*, Matth. Not common. *Sheerness, Sheppey, Tonbridge*
 — *gracilis*, Matth. Local. *Lee, Sheerness*
 — *brevicornis*, Matth. Rather common
Deinopsis erosa, Steph. Local. *Cobham, Sheerness, Lee, Tonbridge*
Hypocyrtus longicornis, Payk. Very common everywhere
 — *lævisculus*, Mann. Rare. *Chatham*
 — *seminulum*, Er. Not common, though occasionally abundant where it occurs. *Cobham Park, Strood, Folkestone*
Conosoma littoreum, L. Not uncommon. *Strood, Darent Wood*
 — *pubescens*, Grav. Generally distributed and common
 — *immaculatum*, Steph. Local
 — *pedicularium*, Grav. Rare. *Tonbridge*
 — *lividum*, Er. Generally distributed
 — *bipunctatum*, Grav. Very rare. *Chatham*
Tachyporus obtusus, L. Generally abundant
 var. *nitidicollis*, Steph. Rare. *Tonbridge*
 — *formosus*, Matth. Rare. *Chattenden, Chatham, Tonbridge*
 — *solutus*, Er. Local, but not uncommon
 — *pallidus*, Sharp. Very local. *Lee*
 — *chrysomelinus*, L. Very abundant everywhere
 — *humerosus*, Er. Generally distributed
 — *tersus*, Er. Not uncommon in the *Chatham* district, and probably widely distributed
 — *hypnorum*, F. Very abundant everywhere
 — *pusillus*, Grav. Somewhat local. *Sheerness, Darent Wood*
 — *brunneus*, F. Generally common
Lamprinus saginatus, Grav. Very rare. *West Wickham*
Cilea silphoides, L. Not uncommon
Tachinus humeralis, Grav. Very common everywhere
 — *bipustulatus*, F. Not common. *Charlton, Catford*
 — *rufipes*, L. Very common everywhere
 — *subterraneus*, L. Common and generally distributed
 — *marginellus*, F. Very common everywhere
 — *laticollis*, Grav. Not common. *Eltham, Tonbridge*

STAPHYLINIDÆ (continued)

- Tachinus elongatus*, Gyll. Rare. *Sheerness, West Wickham*
Megacronus cingulatus, Mann. Rare. *Bexley, Cobham Park, Chattenden, Strood*
 — *analis*, F. Common
 — *inclinans*, Grav. Rare. *Birch Wood, Sevenoaks*
Bolitobius lunulatus, L. (*atricapillus*, F.). Common in fungi
 — *trinotatus*, Er. Common everywhere in fungi
 — *exoletus*, Er. With the preceding, but less common
 — *pygmæus*, F. Common in fungi
Mycetoporus lucidus, Er. Not common. *Bexley, Maidstone*
 — *splendens*, Marsh. Local
 — *lepidus*, Grav. Rather common
 — *longulus*, Mann. Less common than the preceding
 — *nanus*, Er. Rare. *Chatham, Darland Hill*
 — *angularis*, Rey (*reysi*, Panz.). Not common. *Birch Wood*
 — *clavicornis*, Steph. Very local; *Cobham Park*, not common
 — *splendidus*, Grav. Generally distributed and common
 — *longicornis*, Kr. Rare. *West Wickham*
Habrocerus capillaricornis, Grav. Not uncommon
Trichophya pilicornis, Gyll. Rare. *Tonbridge*
Euryporus picipes, Payk. Rare. *Strood, Chattenden, Faversham* (J. J. W. and G. C. C.)
Heterothops binotata, Er. Locally common in decaying seaweed on the shore
 — *prævia*, Er. Rare; among rubbish at Messrs. Spencer's Oil Mills, *Strood*
 — *dissimilis*, Grav. Common
 — *quadripunctula*, Gyll. Rare. *St. Mary Cray, Cobham Park, Darent Wood, Cuxton*
Quedius longicornis, Kr. Very rare. *Cobham Park*, one specimen
 — *microps*, Grav. Very scarce. *Cobham Park, Chatham*
 — *ventralis*, Ar. (*truncicola*, Fairm.). Rare. *Greenwich, Maidstone, Lee, Bearsted, Tonbridge*
 — *lateralis*, Grav. Scarce. *Cobham Park*
 — *mesomelinus*, Marsh. Common
 — *fulgidus*, F. Common. The variety with red elytra, usually referred to *Q. quadripunctatus*, Thoms, has occurred rarely at *Sheerness*
 var. *fageti*, Thoms. Occasional

A HISTORY OF KENT

STAPHYLINIDÆ (continued)

- Quedius cruentus*, Ol. Local, but not uncommon
 — *scitus*, Grav. Rare. *Chatbam, Cobham, Tonbridge*
 — *impressus*, Panz. (cinctus, Payk.). Very common
 — *brevis*, Er. In nests of *Formica rufa* and rarely of *F. fuliginosa*; local, but not uncommon
 — *fuliginosus*, Grav. Local. *Lee*
 — *tristis*, Grav. Very common
 — *molochinus*, Grav. Common
 — *picipes*, Mann. "
 — *nigriceps*, Kr. Local. *Bexley, Chatbam, Cobham Park, Abbey Wood, Darent Wood*
 — *fumatus*, Steph. (*peltatus*, Er.). Local. *Birch Wood, Bexley, Chatbam, Cobham Park, Higham, Maidstone*
 — *maurorufus*, Grav. Local. *Strood, Lee, Higham, Snodland*
 — *umbrinus*, Er. Rare. *Sydenham*
 — *suturalis*, Kies. Local, but not uncommon
 — *scintillans*, Grav. Local. *Cobham Park, Strood, Maidstone, Bearsted, West Wickham*
 — *rufipes*, Grav. Not uncommon
 — *attenuatus*, Gyll. Very local. *Gravesend, Tonbridge*
 — *semiaeneus*, Steph. Local, but not uncommon
 — *boops*, Grav. Very common
Creophilus maxillosus, L. Very common everywhere
Emus hirtus, L. Very rare. *Sheerness (Howard), Darland Hill (Chaney), Gore Court Park, Sittingbourne (J. J. W.)*
Leistotrophus nebulosus, F. Not uncommon
 — *murinus*, L. Common, but somewhat local
Staphylinus pubescens, De G. Not common. *Blackbeath*
 — *fulvipes*, Scop. Rare. *Folkestone*
 — *stercorarius*, Ol. Not common. *Blackbeath, Sheerness, Bredhurst, Whitstable, Deal*
 — *latebricola*, Grav. Rare. *Chattenden, Wigmore Wood, Faversham, Folkestone*
 — *cæsareus*, Ceder. Widely distributed, but not common
Ocypus olens, Müll. Very abundant everywhere
 — *similis*, Payk. Local. *Birchington, St. Peter's (Isle of Thanet), Tonbridge, Folkestone*

STAPHYLINIDÆ (continued)

- Ocypus cyaneus*, Payk. Very rare. *Folkestone*
 — *brunnipes*, F. Not uncommon
 — *fuscatus*, Grav. Rare. *Chattenden, Tonbridge, Margate*
 — *cupreus*, Rossi. Very common
 — *pedator*, Grav. Rare. *Folkestone, Sandwich*
 — *ater*, Grav. Rather common on the coast, but very rare inland
 — *morio*, Grav. Very common
 — *compressus*, Marsh. Local. *Lewisham*
Philonthus splendens, F. Local. *Lee, Greenwich, Darland Hill*
 — *intermedius*. Not very common
 — *laminatus*, Creutz. Common and generally distributed
 — *æneus*, Rossi. Very common
 — *proximus*, Kr. (*succicola*, Thoms.). Scarce. *Sheerness, Cobham, Darent Wood*
 — *addendus*, Sharp. Rare. *Cobham Park*
 — *carbonarius*, Gyll. Not uncommon. *Chatbam, Blackbeath, etc.*
 — *decorus*, Grav. Not common. *Darent Wood, Cobham Park, Cuxton, Tonbridge*
 — *politus*, F. Very common
 — *varius*, Gyll. " "
 — *marginatus*, F. Common
 — *lepidus*, Grav. Very local, but in some numbers where it occurs. *Deal*
 — *albipes*, Grav. Not common. *Sheerness, Maidstone, Abbey Wood, Tonbridge*
 — *umbratilis*, Grav. Rare. *Snodland, Whitstable, Maidstone, Eltham, Tonbridge*
 — *cephalotes*, Grav. Local. *Greenwich, Sheerness*
 — *fimetarius*, Grav. Common
 — *sordidus*, Grav. "
 — *fuscus*, Grav. Very rare. *Chatbam Dockyard; Cobham Park*, one specimen, 1889 (J. J. W.)
 — *ebenus*, Grav. Usually common; recorded however by Mr. Walker as not common in the Rochester district
 — *fumigatus*, Er. Local and not common. *Chatbam, Sevenoaks, Darent Wood, Lee, Tonbridge*
 — *debilis*, Grav. Common
 — *sanguinolentus*, Grav. Common. *Chatbam, Sheerness, etc.*
 — *cruentatus*, Gmel. (*bipustulatus*, Panz.). Common
 — *longicornis*, Steph. (*scybalarius*, Nord.). Not uncommon
 — *varians*, Payk. Common

INSECTS

STAPHYLINIDÆ (continued)

- Philonthus agilis*, Grav. Local. *Whitstable, Tonbridge*
 — *vernalis*, Grav. Rare. *Higham, Chattenden and Strood* (J. J. Walker); *Deal* (Power)
 — *ventralis*, Grav. Local. *Sheerness, Lee, Tonbridge, Dover*
 — *discoideus*, Grav. Not uncommon
 — *quisquiliarius*, Gyll. Local. *Higham, Snodland, Lee, Chatham, Faversham, Tonbridge*
 var. *dimidiatus*, Er. Rare. *Maidstone*
 — *splendidulus*, Grav. Rare. *Tonbridge* (Horner)
 — *thermarum*, Aubé. Local. *Westerham*
 — *nigrita*, Nord. Rare. *Eltham*
 — *fumarius*, Grav. Local. *Higham, Lee, Eltham, Strood, Folkestone*
 — *micans*, Grav. Local. Banks of *Medway, Lee, Birch Wood, Tonbridge*
 — *astutus*, Er. Very rare. *Sandgate*, two specimens (Horner)
 — *trossulus*, Nord. Very common
 — *fulvipes*, F. Rare. *Snodland*, one specimen (J. J. W.)
 — *punctus*, Grav. Rare. *Sheerness and Gravesend*
 — *puella*, Nord. Rare. *Gravesend*
Cafius fucicola, Curt. Rare. *Sheerness*
 — *xantholoma*, Grav. Abundant in decaying seaweed all along the coast
 — *sericeus*, Holme. Local. *Whitstable, Sheerness, Margate, Kingsgate, Broadstairs*
Actobius cinerascens, Grav. Not uncommon, but local. *Strood, Lee, Sheerness, Higham*, scarce (J. J. W.)
 — *signaticornis*, Rey. Rare. Banks of *Medway* below *Strood*
 — *villosulus*, Steph. Rare. *Higham*
 — *procerulus*, Grav. Local. *Whitstable, Lee, Sevenoaks*
Xantholinus fulgidus, F. Scarce. *Tonbridge*
 — *glabratus*, Grav. Very common
 — *ochraceus*, Gyll. Local, but not uncommon
 — *atratus*, Heer. In nests of *Formica rufa*; not uncommon
 — *glaber*, Nord. Under bark, often in company with ants; very rare. *Westerham, Cobham Park*
 — *tricolor*, F. Not uncommon
 — *linearis*, Ol. Very common
 — *longiventris*, Heer. Common
Leptacinus parumpunctatus, Gyll. Local. *Lee, Darenth Wood, Sheerness, Chatham, Tonbridge, Kingsgate*

STAPHYLINIDÆ (continued)

- Leptacinus batychrus*, Gyll. Local, but not uncommon; distributed much as the preceding
 — *linearis*, Grav. Very common
 — *formicetorum*, Märk. In nests of *Formica rufa*; local, but not uncommon. *Plumstead, Chatham, Erith, Margate*
Baptolinus alternans, Grav. Rather common
Othius fulvipennis, F. Not uncommon
 — *læviusculus*, Steph. (*punctipennis*, Lac.) Local, but not uncommon
 — *melanocephalus*, Grav. Rare. *Rochester* district; perhaps the specimens should be referred to the following species
 — *myrmecophilus*, Kies. Generally distributed and common
Lathrobium elongatum, L. Not uncommon
 — *boreale*, Hoch. Widely distributed, but not very common
 — *fulvipenne*, Grav. Very common everywhere
 — *angustatum*, Lac. Rare. *Higham, Strood, Gravesend, Folkestone*
 — *brunnipes*, F. Very common and generally distributed
 — *longulum*, Grav. Generally distributed and common
 — *punctatum*, Zett. Local. *Lee, Darenth Wood, Tonbridge*
 — *quadratum*, Payk. Rare. *Darenth Wood*
 — *terminatum*, Grav. Common
 — *pallidum*, Nord. Rare. *West Wickham*
 — *multipunctum*, Grav. Local. *Chatham, Sheerness, Darenth, Hythe*
Achenium depressum, Grav. Generally distributed
 — *humile*, Nic. Not common. *Chatham, Chattenden, Sheerness, Lee, Tonbridge, Deal, Hythe*
Cryptobium glaberrimum, Herbst (*fracticornis*, Payk). Not uncommon
Stilicus fragilis, Grav. In the damp bottoms of woodstacks; rare but occasionally in numbers. *Darenth Wood, Strood, Cobham, Maidstone, Bearsted, Chatham, Tonbridge*
 — *rufipes*, Germ. Common
 — *orbiculatus*, Er. Local, but not uncommon
 — *subtilis*, Er. Local. *Darland Hill, Tonbridge*
 — *affinis*, Er. Very common
 — *geniculatus*, Er. Not uncommon

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STAPHYLINIDÆ (continued)

- Scopæus sulcicollis*, Steph. (minutus, Er.).
Rare. *Lee, Higham, Darenth, Tonbridge, St. Peter's (Isle of Thanet)*
— *cognatus*, Rey. Very rare, one specimen. *Wingham*, near *Sandwich*; perhaps identical with the preceding
- Medon castaneus*, Grav. Very rare. *Deal* (C. G. Hall)
— *piceus*, Kr. Very rare. *Bexley* (Champion), *Darenth Wood* (Blackburn)
— *brunneus*, Er. Local. *Birch Wood, Chatham, Cobham*
— *fuscus*, Mann. Very local. *Westerham, Tonbridge*
— *apicalis*, Er. Very rare. *Erith*
— *propinquus*, Bris. Very common
— *melanocephalus*, F. Common and generally distributed
— *obsoletus*, Nord. Rare. *Herne Bay, Tonbridge*
- Lithocharis ochracea*, Grav. Common and generally distributed
- Sunius filiformis*, Latr. Rare. *Folkestone*
— *intermedius*, Er. Locally abundant. *Darland Hill, Chatham, Strood, Lee, Sheerness, Tonbridge*
— *angustatus*, Payk. Very common
- Pæderus littoralis*, Grav. Common and generally distributed
— *riparius*, L. Local. *Snodland, Faversham*
— *fuscipes*, Curt. Very local. *Snodland*, in profusion, 1874 (J. J. W.)
- Evæsthetus scaber*, Grav. Local. *Chatham, Wignmore Wood, Lee, Sheerness*
— *ruficapillus*, Lac. Locally abundant. *Snodland, Higham, Strood, Lee*
- Stenus biguttatus*, L. Local. *Snodland, Darenth Wood, Lewisham, Charlton*
— *bipunctatus*, Er. Local. *Darenth Wood, Lee, Sevenoaks, Charlton*
— *guttula*, Müll. Not common. *Sheerness, Charlton, Herne Bay*
— *bimaculatus*, Gyll. Common and widely distributed.
— *asphaltinus*, Er. Rare. *Cobham, Charlton, Strood, Erith, Chatham, West Wickham, Tonbridge*
— *juno*, F. Common and generally distributed
— *ater*, Mann. Local. *Greenhithe, Sheerness, Chatham, Faversham, Chatham, Deal*
— *speculator*, Er. Very common and generally distributed
— *providus*, Er., var. *rogeri*, Kr. Common, but less abundant than the

STAPHYLINIDÆ (continued)

- preceding, and the type form does not occur in Britain
- Stenus buphthalmus*, Grav. Common and generally distributed
— *melanopus*, Marsh. Common and widely distributed
— *incrassatus*, Er. Scarce. *Sheerness, Maidstone, Tonbridge*
— *morio*, Grav. Very rare. *Tonbridge* (Horner)
— *canaliculatus*, Gyll. Local. *Lee, Chatham, Sheerness, Deal*
— *pusillus*, Er. Local, but widely distributed
— *exiguus*, Er. Scarce. *Tonbridge*
— *fuscipes*, Grav. Very local. *Cobham*
— *circularis*, Grav. Not common. *Eltham, Cobham, Tonbridge*
— *declaratus*, Er. Common and generally distributed
— *crassus*, Steph. (*crassiventris*, Thoms.). Local, but not uncommon. *Lee, Eltham, Sheerness, Northfleet, Tonbridge*
— *carbonarius*, Gyll. Rare. *Sheppey, Tonbridge*
— *argus*, Grav. Rare. *Tonbridge*
— *nigritulus*, Gyll. Local. *Lee, Westerham, Northfleet, Tonbridge*
— *brunnipes*, Steph. (*unicolor*, Er.). Abundant everywhere
— *subæneus*, Er. Local. *Chatham, Upnor, Sheerness, Tonbridge*
— *ossium*, Steph. (*impressipennis*, Duv.). Generally common
— *fuscicornis*, Er. Not common. *Cobham, Charlton, Greenhithe, Darenth, Tonbridge*
— *geniculatus*, Grav. Very local. *Wickham*
— *palustris*. Rare. *Bearsted* (Gorham)
— *impressus*, Germ. Very common
— *ærosus*, Er. (*annulatus*, Crotch). *Darenth Wood, Hayes, Plumstead, Deal*
— *pallipes*, Grav. Local. *Lee, Eltham, Tonbridge*
— *flavipes*, Steph. Common and generally distributed
— *pubescens*, Steph. Local, but rather widely distributed
— *binotatus*, Ljungh. Not uncommon
— *canescens*, Rosh. (major, Rey). Local, and as a rule rare. *Darenth Wood, Snodland, Faversham, Maidstone, Sandwich*
— *pallitarsis*, Steph. Local. *Sheerness, Maidstone*

INSECTS

STAPHYLINIDÆ (*continued*)

- Stenus bifoveolatus*, Gyll. Common
 — *nitidiusculus*, Steph. (tempestivus, Er.).
 Very local. *Strood*
 — *picipennis*, Er. Local. *Maidstone, Folkestone*
 — *picipes*, Steph. (rusticus, Er.). Common and generally distributed.
 — *foveicollis*, Kr. (brevicollis, Thoms.). Rare. *Hayes*
 — *cicindeloides*, Grav. Common and generally distributed
 — *similis*, Herbst. Common and generally distributed
 — *solutus*, Er. Rare. *Lee, Birchington near Margate*
 — *tarsalis*, Ljungh. Common and generally distributed
 — *paganus*, Er. Local, but widely distributed.
 — *latifrons*, Er. Local, but not uncommon
 — *fornicatus*, Steph. Rare. *Maidstone*
Oxyporus rufus, F. Local, but not uncommon, and widely distributed
Bledius spectabilis, Kr. Locally common. *Sheerness, Gravesend, St. Mary's Island, Pegwell Bay, Dover, Deal*
 — *tricornis*, Herbst. Very local, but sometimes in profusion. *Sheerness, Sandgate, Deal*
 — *bicornis*, Germ. Very local and scarce. *Pegwell Bay, Deal*
 — *subterraneus*, Er. Scarce. *Maidstone*
 — *longulus*, Er. Very local. *Bexley, Charlton, West Wickham, Maidstone*
 — *fracticornis*, Payk. Scarce. *Charlton, Tunbridge Wells*
 — *opacus*, Block. Rare. *Charlton*
 — *atricapillus*, Germ. Locally abundant. *Strood and Upnor (J. J. W.)*
 — *crassicollis*, Lac. Rare. *Walmer (Dr. Power and Mr. Hall)*
Platystethus arenarius, Fourc. Common everywhere.
 — *cornutus*, Gyll. Generally distributed
 — *capito*, Heer. Local. *Darent Wood, Sheerness, Chatham, Cobham, Sevenoaks, Bearsted, Folkestone, Dover*
 — *nodifrons*, Sahlb. Local, but widely distributed
 — *nitens*, Sahlb. Rare. *Lee*
Oxytelus rugosus, Grav. Very common everywhere
 — *insecatus*, Grav. Local and not common, but widely distributed; it has occurred in some numbers in St. Peter's, Thanet, in decayed potatoes (Wood)

STAPHYLINIDÆ (*continued*)

- Oxytelus sculptus*, Grav. Very common
 — *laqueatus*, Marsh. Common
 — *piceus*, L. Very rare. *Birch Wood, Snodland*
 — *inustus*, Grav. Common
 — *sculpturatus*, Grav. Very common
 — *nitidulus*, Grav. Common
 — *complanatus*, Er. "
 — *clypeonitens*, Pand. (speculifrons, Rye). Rare. *Cobham Park, Sheerness, Plumstead, Tonbridge*
 — *tetracarinatus*, Block. Very common everywhere
 — *fairmairei*, Pand. Very rare. *Queen-down Warren*; one specimen
Haploderus coelatus, Grav. Very common
Ancyrophorus aureus, Fauv. Very scarce. *Tonbridge*
Trogophloeus arcuatus, Steph. Very scarce. *Tonbridge*
 — *bilineatus*, Steph. Very common
 — *rivularis*, Mots. (erichsoni, Sharp). Local, but rather widely distributed
 — *fuliginosus*, Grav. Not common. *Sheerness, Faversham, Tonbridge*
 — *foveolatus*, Sahlb. Rare. *Whitstable and Sheerness (Champion), Darent Wood (Blatch)*
 — *corticinus*, Grav. Generally distributed and common
 — *halophilus*, Kries. Rare. *Sheerness, Rochester, Chatham*
 — *pusillus*, Grav. Not uncommon. *Chatham, Rochester district, Sheerness, Kingsgate, Deal*
 — *tenellus*, Er. Rare. *Darent Wood*
 — *subtilis*, Er. Rare. *Eltham*. (Specimens in Dr. Power's collection from this locality placed under *T. tenellus* ought apparently to be referred to this scarce species)
Syntomium æneum, Müll. Not uncommon. *Dover, Folkestone, Tonbridge*
Coprophilus striatulus, F. Common and generally distributed
Acrognathus mandibularis, Gyll. Very rare. *Tonbridge (Horner), Darent Wood*
Compsochilus palpalis, Er. Very rare. *Sheerness (Walker), Tonbridge* (taken by Mr. Wollaston, and many years after, 1887, in some small numbers by Mr. Horner and Mr. Blatch)
Deleaster dichrons, Grav. Rare. *Lewisham, Bromley, Maidstone, Bearsted*
 var. *leachii*, Curt. Sometimes found with the type, but usually occurs in a different locality. *Hythe, Tonbridge*

A HISTORY OF KENT

STAPHYLINIDÆ (continued)

- Lesteva longelytrata*, Goeze. Common everywhere in moss in damp places
 — *pubescens*, Mann. Not common. *Bromley*
 — *scula*, Er. (*punctata*, *Brit. Cat.*). Local. *Chatham*, *Snodland*, *Folkestone*
Acidota cruentata, Mann. Very rare. *Greenwich*, *Birch Wood*
Olophrum piceum, Gyll. Common and generally distributed
Lathrimæum atrocephalum, Gyll. Common and generally distributed
 — *unicolor*, Steph. Common and generally distributed
Philorhinum sordidum, Steph. Not uncommon. *Darent Wood*, *Sheerness*
Coryphium angusticollis, Steph. Rare. *Darland Hill*, *St. Mary Cray*, *Chatham*
Homalium rivulare, Payk. Abundant everywhere
 — *rugulipenne*, Rye. In decaying seaweed; very rare. *Gravesend*; perhaps described in error from this locality
 — *læviusculum*, Gyll. Common in seaweed all along the coast
 — *riparium*, Thoms. In decaying seaweed; local. *Sheerness*, *Whitstable*, *Pegwell Bay*
 — *allardi*, Fairm. Rare. *Eltham*, *Margate*
 — *exiguum*, Gyll. Rare. *Cobham Park* (Walker)
 — *oxyacanthæ*, Grav. Local, but widely distributed
 — *cæsum*, Grav. Common and generally distributed
 — *nigriceps*, Kries. Local. *Darent Wood*, *Strood*, *Faversham*
 — *pusillum*, Grav. Not uncommon under bark of fir
 — *punctipenne*, Thoms. Not uncommon under bark of birch and beech
 — *rufipes*, Fourc. (*florale*, Payk.). Rather common
 — *salicis*, Gyll. Rare. *Bearsted* near *Maidstone* (Gorham)
 — *vile*, Er. Generally distributed and common under bark
 — *iopterum*, Steph. Local but not uncommon. *Bexley*, *Chatham*
 — *planum*, Payk. Under bark and at sap; local, but not uncommon. *Cobham Park*, *Darent Wood*
 — *concinnum*, Marsh. Common
 — *deplanatum*, Gyll. Rare. *Darland Hill*, *Tonbridge*

STAPHYLINIDÆ (continued)

- Homalium striatum*, Grav. Not uncommon. *Cobham Park*, *Whitstable*, *Sheerness*, *Pegwell Bay*, *Maidstone*, *Deal*
Hapalaræa pygmæa, Gyll. Not common. *Sheerness*, *Birch Wood*, *Cobham Park*, *Darent Wood*, *Bromley*, *Tonbridge*
Eusphalerum primulæ, Steph. Very local. *Chatham*, *Chattenden*, *Maidstone*
Anthobium minutum, F. Local. *Cobham Park*
 — *ophthalmicum*, Payk. Generally distributed and common
 — *torquatum*, Marsh. Generally distributed and common
Proteinus ovalis, Steph. (*brevicollis*, Er.). Generally distributed and common
 — *brachypterus*, F. Generally distributed and common
 — *macropterus*, Gyll. Scarce. *Cobham Park*, *Chattenden*, *Birch Wood*, *Chatham*, *Sheerness*, *Tonbridge*
 — *atomarius*, Er. Local. *Darent Wood*, *Faversham*, *Brasted*
Megarthus denticollis, Beck. Local. *Sheerness*, *Rochester* district, *Tonbridge*
 — *affinis*, Mill. Not uncommon
 — *depressus*, Lac. Generally distributed
 — *sinuatocollis*, Lac. Generally distributed and common
 — *hemipterus*, Ill. Very local, but common where it occurs, in putrid fungi. *Darent Wood*, *Chatham*, *Sheerness*, *Tonbridge*, *Mereworth*, *Sevenoaks*
Phlæobium clypeatum, Müll. Widely distributed
Phlæocharis subtilissima, Mann. Very local and not common. *Sevenoaks*, *Tonbridge*
Pseudopsis sulcata, Newm. Very rare. *Kingsgate*, one specimen
Prognatha quadricornis, Lac. Local. *Cobham Park*, *Chatham*, *Erith*, *Tonbridge*, *Kingsgate*
- ## LEPTINIDÆ
- Leptinus testaceus*, Müll. Rare. *Chatham*, *Cobham Park* (about thirty examples in debris about the entrance of a nest of a humble bee (J. J. Walker))
- ## SILPHIDÆ
- Calyptomerus dubius*, Marsh. Local. *Lee*
Clambus pubescens, Redt. Not uncommon. *Chatham*, *Darent Wood*, etc.
 — *armadillo*, De G. Not uncommon. *Lee*, *St. Mary Cray*
 — *minutus*, Sturm. Scarce. *Cobham Park*

INSECTS

SILPHIDÆ (continued)

- Agathidium atrum*, Payk. Local. *Faversham, Bexley, Rochester* district; very scarce
- *seminulum*, L. Local. *Chatbam, Sevenoaks, Darent Wood, Rochester* district
- *lævigatum*, Er. Generally distributed
- *marginatum*, Sturm. Scarce as a rule. *Sheerness, Chatbam, Deal, Darland Hill*; not rare (J. J. W.)
- *varians*, Beck. Local. *Cobham Park, Chattenden, Queendown Warren, Darent Wood*
- *globosum*, Muls. Rare. *Bexley, Darland Hill, Chatbam, Darent* and *Birch Woods*
- *rotundatum*, Gyll. Rare. *Chatbam, Darent Wood*; sometimes not rare in *Cobham Park* (J. J. W.)
- *nigrinum*, Sturm. As a rule scarce. *Chatbam, Darent Wood, Cobham Park, Chattenden*, etc.; frequent (J. J. W.)
- Amphicyllis globus*, F. Not common, but occasionally occurs in numbers. As a rule very scarce. *Darent Wood, Chatbam, Sheppey, Wignore Wood, Cobham Park, Queendown Warren*, etc.
- Liodes humeralis*, Kug. Locally common
- *orbicularis*, Herbst. As a rule rare. *Chattenden, Darent Wood, Strood*. In snuff-like fungus on decaying wood. *Cobham Park*; common, 1885 and 1889.
- Cyrtusa pauxilla*, Schmidt. Not uncommon, but local. *Wignore Wood, Cobham Park, Charlton, Maidstone, Gravesend, Chatbam, Birch Wood*
- Anisotoma cinnamomea*, Panz. By evening sweeping under beech trees in autumn; rare. *Darland Hill, Queendown Warren, Cobham Park, Chatbam, Eythorne* near *Dover*
- *oblonga*, Er. (*grandis*, Fairm.) Very rare. *Cobham Park*
- *picea*, Ill. Very rare. *Sandwich* (E. A. Waterhouse)
- *dubia*, Kug. Not uncommon
- *badia*, Sturm. Local, but not uncommon, and widely distributed
- *ovalis*, Schmidt. Rare. *Cobham Park, Sheppey*
- *punctulata*, Gyll. (*litura*, Steph.). Local. *Cobham Park, Queendown Warren*, not rare; *Folkestone*
- *calcarata*, Er. Generally distributed and common

SILPHIDÆ (continued)

- Anisotoma curvipes*, Schmidt (*macropus*, Rye). Very rare. *Cuxton*; one specimen, 22 June, 1895 (J. J. W.)
- *nigrita*, Schmidt. Very local. *Darland Hill, Chatbam*
- *lunicollis*, Rye. Very rare. *Forest Hill* (Marsh.), *Sydenham* (Waterhouse)
- *triepkei*, Schmidt. Very rare. *Forest Hill* (Power)
- *pallens*, Sturm. Very rare. *Deal*; three examples, 1873 (J. J. W.)
- *rugosa*, Steph. Very rare. *Cobham Park*; one example, 2 October, 1897 (J. J. Walker)
- *parvula*, Sahlb. Rare. *Chattenden, Chatbam, Cobham Park, Darent Wood, Whitstable*
- Colenis dentipes*, Gyll. Not uncommon and generally distributed
- Agaricophagus cephalotes*, Schmidt. Rare. *Cobham Park, Chatbam, Sandwich*
- *conformis*, Er. Rare. *Birch Wood*. Perhaps not distinct from the preceding
- Hydnobius punctatissimus*, Steph. Rare. *Queendown Warren, Folkestone*
- *strigosus*, Schmidt. Rare. *Chattenden, Cobham Park, Sheppey, Darent Wood, Maidstone*
- Necrophorus humator*, Goeze. Common and generally distributed
- *mortuorum*, F. Not uncommon
- *vestigator*, Hersch. Rare. *Deal*
- *ruspator*, Er. Rare. *Cobham Park*
- *interruptus*, Steph. Rare. *Halling Downs, Cobham Park, Dover*
- *vespillo*, L. Local. *Greenwich, Gravesend, Cobham Park, Sheerness*
- Necrodes littoralis*, L. Very local and not common. *Snodland, Halling Downs*
- Silpha tristis*, Ill. Local. *Darland Hill*, scarce (J. J. W.); *Sheerness, Chatbam, Deal, Dover*
- *obscura*, L. Local, but widely distributed
- *quadripunctata*, L. Very local. *Darent Wood; Chattenden*, a dark variety (J. J. W.)
- *opaca*, L. Rare. *Whitstable, Deal*
- *thoracica*, L. Very local and not common. *Cobham Park*
- *rugosa*, L. Generally distributed and common
- *sinuata*, F. Not uncommon
- *lævigata*, F. Not uncommon and widely distributed
- *atrata*, L. Generally distributed and common

A HISTORY OF KENT

SILPHIDÆ (continued)

- Choleva angustata*, F. Rare. *Upnor, Sheerness, Chatham*
- *cisteloides*, Fröh. Rather common, but never plentiful
- *intermedia*, Kr. Rare. *Birch Wood, Dover*
- *spadicea*, Sturm. Rare. *Cobham Great Wood, Bexley, St. Mary Cray*
- *agilis*, Ill. Local. *Sheerness, Bexley, Darent Wood*
- *velox*, Spence. Common and generally distributed
- *wilkini*, Spence. Less common than the preceding, but widely distributed
- *anisotomoides*, Spence. Local. *Queen-down, Chatham, Darent Wood, Ramsgate, Folkestone*
- *fusca*, Panz. Local and never common. *Greenwich, Rochester, Cobham Park, Chatham*
- *nigricans*, Spence. As the preceding. *Chattenden, Cobham Park, Lee, Birch Wood, Sheerness*
- *morio*, F. Mr. Walker records this as generally distributed and not rare in the *Rochester* district; as a rule it is not common. *Sheerness, Chatham, Lee*
- *grandicollis*, Er. Local. *Cobham Park, Chatham, Sheerness, etc.*
- *nigrita*, Er. Local, but widely distributed
- *tristis*, Panz. Generally distributed and common
- *chrysomeloides*, Panz. Generally distributed
- *fumata*, Spence. Not uncommon
- *watsoni*, Spence. With the preceding, but less common
- *colonoides*, Kr. Very rare; one specimen in rotten stump of ash, April, 1897. *Cobham Park* (J. J. W.)
- *sericeus*, F. Common everywhere
- *varicornis*, Kr. Very rare. *Folkestone* (Power)
- Colon viennense*, Herbst. Rare. *Wigmore Wood, Cobham Park, Rainham, Darent Wood, Birch Wood, Lee, Chatham*
- *serripes*, Sahlb. Rare. *Cobham Park, Maidstone, Lee*
- *dentipes*, Sahlb. Very rare. *Darent Wood* (Champion)
- var. *zebei*, Kr. Very rare. *Wigmore Wood near Chatham* (J. J. W.)
- *brumeum*, Latr. The only member of the genus that cannot be called rare. *Sevenoaks, Darent Wood, Chatham, Cobham Park, Chattenden, etc.*

SILPHIDÆ (continued)

- Colon appendiculatum*, Sahlb. Very rare. *Birch Wood* (Power)
- *denticulatum*, Kr. Very rare. *Darent Wood* (Power), *Hythe* (Rye)
- *latum*, Kr. Very rare. *Greenhithe* (Waterhouse)

[The members of the genus *Colon* are among our very rarest beetles; they are all taken by sweeping in the summer]

Bathyscia (*Adelops*) *wollastoni*, Jans. This species used to be considered extremely rare, but has occurred in numbers in the *Isle of Thanet* near *Broadstairs* in decaying seed potatoes, where I have taken it with the Rev. T. Wood in his garden; it has also occurred at *Staple* and *Wingham*, and is probably general but overlooked

SCYDMÆNIDÆ

- Neuraphes elongatulus*, Müll. Not common. *Lee, Faversham, Sandwich*
- *angulatus*, Müll. Not common. *Lee, Sheerness, West Wickham, Tonbridge, Sandwich*
- *sparshalli*, Denny. Rare. *Sheerness, Lee, Cobham Park, Sittingbourne*
- var. *minutus*, Chaud. (pumilio, Schaum). Rare. *Lee* (Power)
- *longicollis*, Mots. (præteritus, Rye). Rare. *Cobham Park, Wigmore Wood, Snodland, Erith, Strood, Folkestone, Sandwich*
- Scydmaenus scutellaris*, Müll. Generally distributed and common
- *collaris*, Müll. Usually common. *Rochester* district, scarce (J. J. W.)
- *pusillus*, Müll. Rare. *Chatham* district; once found in some numbers at *Snowledge Bottom* (J. J. W.)
- *exilis*, Er. Under rotten beech bark. *Cobham Park*, rare
- Euconnus denticornis*, Müll. Rare. *Faversham, Ashford, Darent Wood, Chattenden*
- *hirticollis*, Ill. Rare. *Snodland, Faversham*
- *fimetarius*, Chaud. Rare. *Sheerness, Bromley, Darent Wood, Tonbridge*
- Eumicrus tarsatus*, Müll. Generally distributed and common
- Euthia scydmaenoides*, Steph. Rare. *Blackheath, Dover*
- *plicata*, Gyll. Very rare. *Cobham Park*, one specimen (J. J. W.)
- Cephennium thoracicum*, Müll. Not uncommon

INSECTS

PSSELAPHIDÆ

- Pselaphus heisei*, Herbst. Generally distributed and not uncommon
- Tychus niger*, Payk. Common and generally distributed
- Bythinus bulbifer*, Reich. Common in several localities. *Chatham* district, scarce
- *curtsii*, Local. *Chatham, Cobham, Birch Wood*
- *securiger*, Reich. Rare. *Bromley* (Saunders)
- *burrellii*, Denny. Rare. *Faversham, Bromley, Birch Wood*
- Batriscus venustus*, Reich. In or about ants' nests, chiefly *Formica fuliginosa*; rare. *Birch Wood*
- Rybaxis sanguinea*, L. Locally common
- Bryaxis waterhousei*, Rye. Very local. *Rochester* (bank of *Medway*), *Rainham, Strood, Sheerness, Whitstable*
- *fossulata*, Reich. Generally distributed
- *helferi*, Schmidt. Salt marshes; locally common. *Gravesend, Chatham, Sheerness, Whitstable, Strood, Kingsgate, Folkestone*
- *hæmatica*, Reich. Local, but occasionally abundant; more frequent about the banks of large rivers. *Chatham*
- *juncorum*, Leach. Generally distributed
- *impressa*, Panz. Not common. *Lee, Eltham, Strood*
- Trichonyx sulcicollis*, Reich. Very rare. *Cobham Park* (J. J. W.), *Lee* (Douglas and Scott)
- Bibloporus bicolor*, Denny. Under bark; not common. *Cobham Park, Bexley, Sevenoaks, Brasted, Bearsted*
- Euplectus kunzei*, Aubé. In moss, dead leaves, etc.; rare. *Cobham Park, Sevenoaks, Greenhithe, Darent Wood, Bearsted*
- *duponti*, Aubé. Very rare; one specimen under rotten beech bark in company with *B. bicolor* at *Cobham Park* (J. J. W.)
- *karsteni*, Reich. In cut grass, hot beds, etc.; rare under loose bark. *Cobham Park, Strood*
- *signatus*, Reich. In vegetable refuse, cut grass, etc.; rarely under bark; not uncommon in some localities, more scarce in others
- *nanus*, Reich. In haystack and vegetable refuse, also under bark; rare. *Lee*
- *sanguineus*, Denny. As the preceding; not uncommon in some localities,

PSSELAPHIDÆ (continued)

- scarce apparently in others, but probably overlooked
- Euplectus piceus*, Mots. (nigricans, Chaud.). Under bark; very scarce in hotbeds; not common. *Darent Wood, Cobham Park, St. Mary Cray, Hawkhurst, Maidstone*
- *ambiguus*, Reich. Many places at roots of grass, occasionally in haystacks; local, but sometimes not uncommon where it occurs. *Lee, Eltham, Sheerness, Bromley*
- ## TRICHOPTERYGIDÆ
- Ptinella aptera*, Guér. Under bark of dead trees; not uncommon. *Cobham Park, Brasted*
- Trichopteryx thoracica*, Waltl. Rare. *Lee*
- *atomaria*, De G. Not uncommon
- *anthracina*, Matth. Rare. *Chatham, Sheerness*
- *grandicollis*, Mannh. Not uncommon. *Lee, Whitstable*
- *lata*, Mots. Common everywhere
- *cantiana*, Matth. Rare. *Tonbridge* (Wollaston)
- *fascicularis*, Herbst. Not uncommon. *Lee*
- *seminitens*, Matth. *Snodland*, not uncommon
- *attenuata*, Gill. Rare. *Snodland*
- *sericans*, Heer. Not common. *Lee, Kingsgate*
- *bovina*, Mots. Not uncommon. *Chatham, St. Mary Cray*, etc.
- *edithia*, Matth. Very rare. *Tonbridge* (Wollaston)
- *longula*, Matth. Rare. *Tonbridge*
- *montandonii*, All. " "
- *chevrolatii*, All. " "
- Nephanes titan*, Newm. Locally common. *Darent Wood, Tonbridge, Kingsgate*. Probably overlooked; sometimes in profusion where it occurs
- Ptilium spencei*, All. Locally common. *Lee, Tonbridge*
- *exaratum*, All. Rare, *Tonbridge*
- *myrmecophilum*, All. In nests of *Formica rufa*. *Chislehurst*
- *foveolatum*, All. Locally abundant. *Kingsgate*
- Millidium trisulcatum*. Local. *Tonbridge*
- Actidium coarctatum*, Hal. Locally common; under seaweed on the coast, and also inland in hotbeds, etc. *Sheerness* (J. J. W.), *Kingsgate*, in profusion (T. Wood); formerly considered extremely rare

A HISTORY OF KENT

TRICHOPTERYGIDÆ (continued)

- Nossidium pilosellum*, Marsh. Local. *Cobham Park, Birch Wood, Darent Wood*
Ptenidium punctatum, Gyll. Under seaweed; locally common. *Whitstable, Kingsgate*
 — *fuscicorne*, Er. Local. *Lee, Eltham*
 — *nitidum*, Heer (*pusillum*, Er.). Local. *Sheerness*
 — *evanescens*, Marsh. (*apicale*, Er.). Common everywhere
 — *formicetorum*, Kr. In nests of *Formica rufa* and *F. fuliginosa*. *Wigmore Wood*; scarce
 — *turgidum*, Thoms. *Strood*, rare (*Champion*); *Cobham Park*, in wet decayed ash-wood, rather common (J. J. W.)

CORYLOPHIDÆ

- Orthoperus*, Kluki, Wank. (*brunnipes*, Brit. Cat.). Local. *Sheerness, Cobham Park*
 — *atomus*, Gyll. *Sheerness*; probably general but overlooked
Corylophus cassidioides, Marsh. Not uncommon. *Gravesend, Sheerness, Darent Wood, Birchington*, etc.
 — *sublævipennis*, Duv. Rare. *Gravesend, Herne Bay*
Sericoderus lateralis, Gyll. Generally distributed and common

PHALACRIDÆ

- Phalacrus corruscus*, Payk. Common and generally distributed
 var. *humberti*, Tourn. Not uncommon. *Sheerness, Chatham, Darent Wood, Whitstable*, etc.
 — *brisouti*, Rye. Rare. *Gravesend, Lee, Rainham, Lewisham, Sheppey, Deal*
 — *brunnipes*, Bris. Rare. *Chatham, Chattenden, Sheerness, Lee*
Olibrus corticalis, Panz. Locally common and widely distributed
 — *æneus*, F. Common everywhere
 — *liquidus*, Er. Common and generally distributed
 — *particeps*, Muls. (*affinis*, Brit. Cat.). Rare. *Folkestone*
 — *millefolii*, Payk. Rare. *Lee, Kingsgate*
 — *pygmæus*, Sturm. Not common. *Darent Wood, Cobham*
Stilbus testaceus, Panz. (*geminus*, Ill.; *consimilis*, Marsh.). Very common everywhere
 — *atomarius*, L. Rare. *Snodland*
 — *oblongus*, Er. In stems of *Typha*; locally common. *Snodland, Chatham, Gravesend, Sheppey, Birchington, Pegwell Bay*

COCCINELLIDÆ

- Subcoccinella* 24-punctata, L. (*Lasia globosa*, L.). Locally common

COCCINELLIDÆ (continued)

- Hippodamia* 13-punctata, L. Marshy places on reeds, etc.; rare. *Deal*
 — *variegata*, Goeze (*mutabilis*, Scriba). Local. *St. Mary Cray, Kingsgate, Margate, Deal*
Anisosticta 19-punctata, L. Marshy places, amongst reeds and aquatic plants. Local. *Lee, Gravesend, Birchington*
Adalia obliterata, L. On firs; not uncommon
 — *bipunctata*, L. Abundant throughout the kingdom
Mysia oblongoguttata, L. On firs. Local. *West Wickham*
Anatis ocellata, L. On firs. Locally common
Coccinella 10-punctata, L. (*variabilis*, Ill.). Common everywhere
 — *hieroglyphica*, L. Under fir trees, etc. Local. *Brasted, Chattenden, Chatham*
 — 11-punctata, L. Generally common
 — 7-punctata, L. Common everywhere
 — *distincta*, Fald. (*labilis*, Muls.). Very local in sandy places. *Herne Bay, Whitstable, Kingsgate*
Halyzia 16-guttata, Poda. Local. *Whitstable, Sheerness*
 — 14-guttata, L. Not uncommon on young alders, larch, whitethorn, etc.
 — 18-guttata, L. On firs; not uncommon
 — *conglobata*, L. (14-punctata, L.). Common and generally distributed
 — 22-punctata, L. Common and generally distributed
Micraspis 16-punctata, L. Marshy places; local, but very common where it occurs var. *poweri*, Weise. *Lee Pit (Power)*; very rare
Hyperaspis repennis, Herbst. Rather scarce and very local. *Sheerness*
Scymnus pulchellus, Herbst (4-lunulatus, Ill.). One example, 'Kent' (Rye's collection)
 — *nigrinus*, Kug. On the Scotch fir; scarce. *Chattenden, Chatham, Birch Wood*
 — *pygmæus*, Fourc. Local. *Chatham, Lee, Deal, Dover*
 — *frontalis*, F. Common
 — *suturalis*, Thunb. Not uncommon on and under the Scotch fir
 var. *limbatus*, Steph. Not uncommon. *Lee*
 — *testaceus*, Mots. (*mulsanti*, Wat.). Marshy places, at roots of grass, under seaweed, etc.; local. *Lee, Chatham, Chattenden, Sheerness, Folkestone*

INSECTS

COCCINELLIDÆ (continued)

- Scymnus hæmorrhoidalis*, Herbst. Common and generally distributed
 — *capitatus*, F. Local. *Rochester* district, *Lee*, *Faversham*
 — *ater*, Kug. Sandy places, at roots of grass, etc.; rare. *Deal*
 — *minimus*, Rossi. Very local. *Chatham*, *Darland Hill*, *Cobham*, *Belvedere*, *Sheerness*, *Darenth Wood*, *Birch Wood*
Platynaspis luteorubra (villosa, Fourc.). Very local. *Darland Hill*, *Chatham*, in profusion under bark of dead fir trees in winter (J. J. W.); rarely under oak bark, *Queendown Warren* (J. J. W.); *Deal*, *Folkestone*
Chilocorus similis, Rossi. Local, but not uncommon. *Chatham*, *Darenth Wood*, *Chattenden*, *Shooters Hill*, *Folkestone*
 — *bipustulatus*, L. Apparently very local. *Brasted*
Exochomus 4-pustulatus, L. Locally common. *Chatham*, *Dartford*, *Shooters Hill*. Under fir bark, *Darland Hill*, scarce (J. J. W.)
Rhizobius litura, F. Common everywhere
Coccidula rufa, Herbst. Very common and generally distributed
 — *scutellata*, Herbst. Marshy places on aquatic plants; local. *Gravesend*, *Sheerness*, *St. Mary's Island*, *Birchington* (abundant), *Pegwell Bay*

ENDOMYCHIDÆ

- Mycetæa hirta*, Marsh. In haystack refuse, cornbins, etc.; often in cellars about beer drippings and in fungi in wine cellars. Generally distributed and common
Alexia pilifera, Müll. Locally common and widely distributed
Lycoperdina bovistæ, F. In puff balls (*Lycoperdon bovistæ*); very local, but generally common where found. *Birch Wood*
Endomychus coccineus, L. In fungoid growth, and under bark of decaying birch, elm, etc.; locally common. *Sevenoaks*, *Lewisham*, *Cobham Park*, *Cuxton*, *Queendown Warren*, *Boxley*, *Westerham*, *Abbey Wood*, *Sittingbourne*

EROTYLIDÆ

- Dacne humeralis*, F. In hard boleti on beech and elms; rare. *Sheerness*
 — *ruffrons*, F. In fungoid growth on trees; locally common
Triplax russica, L. In fungi on trees; not common. *Darenth Wood*

EROTYLIDÆ (continued)

- Triplax lacordairei*, Crotch. In fungoid growth on ash and other trees; very rare. *Darenth Wood* (Champion), *Erith* (Power)
Cyrtotriplax bipustulata, F. In fungi on trees and rotten stumps; local and not common. *Darenth Wood*, *Birch Wood*

COLYDIIDÆ

- Aglenus brunneus*, Gyll. In manure heaps, cornbins, hotbeds, etc.; rare. *Ashford*
Oxylæmus variolosus, Duft. (cæsus, Er.). Under bark; very rare. *Charlton* (Pelerin)
Orthocerus muticus, L. Sandy places; local, but not uncommon. *Sheerness*, *Deal*, *Dover*
Cicones variegatus, Hellw. Under bark of beech and hornbeam; rare. *Bromley*, *Chatham*, *Westerham*, *Chilham*
Langelandia anophthalma, Aubé. Very rare; the only locality in Britain is *St. Peter's, Thanet*, where I took it in decaying seed potatoes in 1886 in the Rev. J. G. Wood's garden, where his son had discovered it some little time before
Cerylon histeroideus, F. Under bark and in ants' nests; rather common
 — *fagi*, Bris. Under bark and under fallen beech branches; rare. *Cobham Park*, *Chatham*, *Sevenoaks*, *St. Mary Cray*, *Darenth Wood*
 — *ferrugineum*, Steph. (angustatum, Er.). Under bark of felled ash and beech trees; very local, but occasionally abundant. *Cobham Park*, *Chatham*, *Chilham*

HISTERIDÆ

- Hister quadrimaculatus*, L. Formerly not uncommon on or near the coast. *Gravesend*, *Sheerness*, *Chatham*, *Whitstable*, *Herne Bay*, *Ramsgate*, *Deal*. Appears now to be much less often met with
 — *unicolor*, L. Generally distributed and common
 — *cadaverinus*, Hoff. Generally distributed and common
 — *succicola*, Thoms. In carcases and also putrid fungi and at sap; not common. *Cobham Park*, *Sevenoaks*, *Darenth* and *Birch Woods*
 — *purpurascens*, Herbst. Local but widely distributed
 — *neglectus*, Germ. Not uncommon in several localities. Banks of *Medway*, not common

A HISTORY OF KENT

HISTERIDÆ (continued)

- Hister carbonarius*, Ill. Generally distributed and common
- *sinuatus*, Ill. Very rare. *Dartford Heath* (Stephens); doubtfully indigenous
- *bissexstriatus*, F. Not common, but occasionally in numbers. *Blackbeath, Deal*; *Sheerness* in profusion in flood refuse (J. J. W.)
- *12-striatus*, Schr. Local. *Blackbeath, Chatham Dockyard, Sheerness, Deal*
- *bimaculatus*, L. Common and widely distributed
- Carcinops minima*, Aubé. Common and widely distributed
- Paromalus flavicornis*, Herbst. Not uncommon. *Greenwich, Chatham, Cobham, Chilham*
- Dendrophilus punctatus*, Ill. In nests of *Formica fuliginosa*, also in rotten wood and dead animals; not common. *Greenwich, West Wickham*
- *pygmæus*, L. In nests of *Formica rufa*; local. *Plumstead, Wigmere Wood*
- Myrmex piceus*, Payk. In nests of *Formica rufa*; local. *Plumstead*
- Gnathoncus nannetensis*, Mars. In birds' nests, dead birds, haystack refuse, etc.; not common. *Cobham Park, Lee, Sheerness, Deal*
- Saprinus nitidulus*, Payk. Generally distributed and common
- *æneus*, Gyll. Generally distributed and common
- *immundus*, Gyll. On sandhills near the coast; very local. *Deal*
- *virescens*, Payk. In dung, sometimes on flowers of watercress feeding on the larvæ of *Phædon cochleariæ*; rare. *Cobham Park, Sheerness, Darent Wood, Maidstone, Sandwich, Deal, Folkestone*
- *metallicus*, Herbst. On sandhills near the coast; rare. *Deal*
- *rugifrons*, Payk. On the coast; rare. *Deal*
- *maritimus*, Steph. On the coast; rare. *Margate*
- Abraeus globosus*, Hoff. In rotten wood; local. *Cobham Park, Abbey Wood, West Wickham*
- *granulum*, Er. As a rule very rare, but taken in some numbers in 1889 in the rotten wood of an ash tree at *Cobham Park*
- Acritus minutus*, Herbst. In manure heaps and hotbeds, etc.; rather common. *Sheerness, Greenwich, Whitstable*

HISTERIDÆ (continued)

- Onthophilus striatus*, F. In dung, vegetable refuse, etc.; not uncommon

MICROPEPLIDÆ

- Micropeplus porcatus*, Payk. Local. *Sevenoaks, Birch Wood*
- *staphylinoides*, Marsh. Local. *Sheerness, Faversham*
- *margaritæ*, Duv. Generally distributed

NITIDULIDÆ

- Brachypterus gravidus*, Ill. On *Linaria vulgaris*; not uncommon and widely distributed
- *pubescens*, Er. On nettles; generally distributed
- *urticæ*, Kug. On nettles; very common everywhere
- Cercus pedicularius*, L. On *Spiræa ulmaria* in marshy places; not common. *Greenhithe, Maidstone*
- *bipustulatus*, Payk. On *Spiræa*, *Epilobium*, *Carex*, etc.; local. *Snodland, Maidstone, Wingham near Sandwich*
- *rufilabris*, Latr. Often on reeds and rushes and on other plants; common
- Carpophilus hemipterus*, L. *Chatham Dockyard*, one specimen at sap of a *Cossus* infected poplar (J. J. W.)
- Epuræa decemguttata*, F. At sap of oaks, etc.; rare. *Tonbridge*
- *diffusa*, Bris. One specimen at sap of a *Cossus* infected poplar in *Chatham Dockyard* (J. J. W.)
- *æstiva*, L. In hawthorn blossom in spring; very abundant
- *melina*, Er. With the preceding; local. *Chatham, Darent Wood*
- *floreæ*, Er. Under bark, at sap and in flowers; local but not uncommon
- *deleta*, Er. Usually in fresh *Boleti*; not uncommon. *Snodland, Darent Wood, Chatham*
- *parvula*, Sturm. In faggots; very local. *Darent Wood*
- *obsoleta*, F. Under bark, at sap, in fungi, etc. Not uncommon
- *neglecta*, Sturm. At sap of freshly cut trees, also in faggots; very rare. *Darent Wood* (Champion), *West Wickham* (Janson)
- *pusilla*, Er. Under bark and at sap; local. *Darent Wood*
- Omosiphora limbata*, F. In fungi, etc.; local, sometimes plentiful. *Chatham, Cobham Park, Sheerness, Dartford*
- Micrurula melanocephala*, Marsh. On flowers and trees in blossom in early summer; local. *Cobham Park*, in profusion on maple blossoms; *Sevenoaks, St. Mary Cray, Birch Wood, Dover*

INSECTS

NITIDULIDÆ (continued)

- Nitidula bipustulata*, L. Under bones, carcasses of birds and animals, etc.; Rather common
- *quadripustulata*, F. As the preceding; not common. *Darenth Wood, Blackheath, Chatham, Sheerness, Whitstable*
- *rufipes*, L. As the preceding; rare. *Darenth Wood, Gravesend, Chatham, Sheerness*¹
- Soronia punctatissima*, Ill. At exuding sap, near burrows of *Cossus*; not common. *Darenth Wood, Chatham Dockyard, Cobham Park, etc.*
- *grisea*, L. As the preceding, but much commoner
- Amphotis marginata*, Er. Old beech trees, in runs of *Formica fuliginosa*; rare. *Birch Wood, Maidstone*
- Omosita colon*, L. Under bones, etc.; very common
- *discoidea*, F. Under bones, etc.; very common
- Thalycra sericea*, Sturm. At exuding sap; near *Cossus* burrows; rare. *Cobham Park, Chattenden, Bromley, Birch Wood, Sandwich*
- Pocadius ferrugineus*, F. In decaying *Lycoperdons* and other fungi; local. *Cobham Great Wood*, scarce; *Dover*
- Pria dulcamaræ*, Ill. On *Solanum dulcamara*; not uncommon, but rather local. *Cobham* and surrounding district, *Sheerness, Lee, Darenth Wood*
- Meligethes rufipes*, Gyll. On various flowers, especially hawthorn; very common
- *lumbaris*, Sturm. On *Umbelliferæ*, broom and other flowers; local. *Rochester* district, not rare on hawthorn; *Snodland, Darenth Wood*
- *fulvipes*, Bris. In marshy places on *Cruciferæ* and other flowers; rare. *Strood, Chattenden, Darenth Wood*
- *coracinus*, Sturm. On the flowers of *Galium* and *Prunus spinosa*; very rare. *Darenth Wood (Rye)*
- *æneus*, F. On flowers, especially *Cruciferæ* and *Ranunculaceæ*; very abundant everywhere
- *viridescens*, F. With the preceding and nearly as abundant
- *difficilis*, Heer. On *Labiataæ*, especially *Lamium album*; locally common. *Darland Hill, Chatham, Sheerness, St. Mary Cray, Darenth Wood, Maidstone*

¹ This and the preceding species were taken plentifully by Com. Walker in Chatham Dockyard in 1897 and 1898 in a bone laid down for a trap.

NITIDULIDÆ (continued)

- Meligethes kunzei*, Er. On *Agraphis nutans*, *Lamium album*, etc.; rare. *Chatham*
- *memnonius*, Er. On *Labiataæ*, especially *Lamium album* and *Stachys sylvatica*; not uncommon
- *brunnicornis*, Sturm. As the preceding; not uncommon
- *pedicularius*, Gyll. On *Lamium album* and *Salvia pratensis*; local. *Chatham, Darenth Wood*
- *bidens*, Bris. On *Teucrium scorodonia*; local. *Chatham, Birch Wood*
- *umbrosus*, Sturm. On *Labiataæ*, *Genistæ*, *Hieracium*, etc.; very local, but not uncommon. *Chatham, Sevenoaks, Darenth Wood, Bearsted, Braisted, etc.*
- *incanus*, Sturm. On *Echium vulgare*; very rare. *Darenth Wood*, one specimen (G. R. Waterhouse)
- *ovatus*, Sturm. On *Labiataæ*; not uncommon in several localities. *Rochester* district, rare (J. J. W.)
- *flavipes*, Sturm. On *Labiataæ*, etc.; locally common
- *picipes*, Sturm. On various flowers; abundant everywhere
- *rotundicollis*, Bris. On *Trifolium* and *Genista*; very rare. *Chatham*
- *symphyti*, Heer. On *Agraphis nutans*; rare. *Darenth Wood, St. Mary Cray, Chatham*
- *serripes*, Gyll. On *Echium vulgare*, etc.; not common. *Darenth Wood, Faversham*
- *murinus*, Er. (*seniculus*, Er.). On *Cynoglossum* and *Echium vulgare*; locally common. *Chatham, Maidstone* var. *planiusculus*, Er. Very rare. *Birch Wood (Power)*
- *lugubris*, Sturm. On *Thymus serpyllum*, *Helianthemum*, etc.; very local. *Chattenden, Wigmere Wood, Sheerness, Bearsted, Maidstone*
- *obscurus*, Er. (*distinctus*, W. C.). On *Mentha*, *Teucrium*, *Cynoglossum*, etc.; local and widely distributed
- *erythropus*, Gyll. On *Helianthemum vulgare*, *Potentilla tormentilla*, etc.; locally common
- *solidus*, Sturm. On *Helianthemum vulgare*, chiefly in chalky places; local, but not uncommon. *Darenth Wood, Chatham, Dartford, Birch Wood, Bearsted, Faversham, etc.*
- Cychramus luteus*, F. On flowers of whitethorn and also in fungi; not uncommon

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NITIDULIDÆ (continued)

Cychramus fungicola, Heer. In fungi; not uncommon

Cryptarcha strigata, F. At exuding sap of *Cossus* infested oaks, also under bark; rare. *Cobham Park, Westerham, Belvedere*

— *imperialis*, F. With the preceding, but more scarce. *Cobham Park*

[As far as I know no species of *Ips* has been recorded from Kent, but *I. quadripunctata* probably occurs, as it is not rare in Surrey at sap and under bark.]

Rhizophagus cribratus, Gyll. Under bark and at roots of trees, especially oak; rare. *Birch Wood*

— *depressus*, F. Under bark of oak, fir, etc.; local. *Chatham, Darland Hill*

— *perforatus*, Er. Under bark and at sap; not common as a rule. *Cobham Park, Darland Hill*, frequent (J. J. W.); *Sheerness, Darenth, St. Peter's (Isle of Thanet)*

— *parallelocollis*, Er. Under bark, at sap, in fungoid growth, etc.; not common. *Cobham Park*

— *ferrugineus*, Payk. Under bark, at fir sap, etc.; local. *Darland Hill*, scarce; *Sevenoaks, Darenth Wood*

— *bipustulatus*, F. Under bark, at sap, etc.; very common

— *politus*, Hellw. Under bark of pines, etc.; very rare. *Lee*, one specimen (Douglas)

TROGOSITIDÆ

Nemosoma elongatum, L. Under bark, parasitic on *Hylesinus vittatus*; very rare. *Darenth Wood* (Stephens)

Tenebrioides mauritanicus, L. In granaries, etc.; not uncommon—an imported species

Thymalus limbatus, F. Under bark; very rare. *Westerham* (Stephens)

MONOTOMIDÆ

Monotoma conicollis, Aubé. In nests or *Formica rufa*; local, but not uncommon where it occurs. *Plumstead, Wigmore Wood*

— *formicetorum*, Thoms. With the preceding; perhaps less common

— *spiniollis*, Aubé. In cut grass, hotbeds, haystack bottoms, etc.; not common. *Chatham, Darenth Wood, Maidstone, Forest Hill, Kingsgate*, etc.

— *brevicollis*, Payk. As the preceding; rare. *Gravesend, Sheerness, Darenth Wood, Maidstone*

— *picipes*, Herbst. As the preceding; very common

MONOTOMIDÆ (continued)

Monotoma quadricollis, Aubé. In haystack bottoms, dungheaps, etc.; local, but not uncommon

— *rufa*, Redt. In haystack refuse, cut grass, etc., sometimes in granaries; locally common. *Lee, Sheerness, Eltham, New Brompton*

— *sub-4-foveolata*, Wat. As the preceding; very rare. *Strood and Sheerness* (J. J. W.)

— *longicollis*, Gyll. As the preceding; not common. *Sheerness, St. Peter's (Isle of Thanet)*

LATHRIDIIDÆ

Anommatus 12-striatus, Wesm. In decaying wood, refuse, rotten seed potatoes underground, etc.; rare. *Sheerness* (Walker), *St. Peter's (Isle of Thanet)* and *Kingsgate* (T. Wood)

Lathridius lardarius, De G. In moss, vegetable refuse, etc.; generally distributed

— *angulatus*, Humm. As the preceding; common

Coninomus nodifer, Westw. In vegetable refuse, woodstacks, faggots, etc.; very common

— *carinatus*, Gyll. Under bark, in dead twigs, moss, etc.; very rare. *Sydenham*

Enicmus minutus, L. In stacks, vegetable refuse, etc.; abundant everywhere

— *transversus*, Ol. As the preceding; abundant everywhere

— *testaceus*, Steph. In powdery fungus on decaying wood; as a rule rare, but occasionally in numbers. *Darenth Wood, Cobham Park*

Cartodere ruficollis, Marsh. In haystack and other refuse, fungi, etc.; locally common. *Cobham Park, Lee, Plumstead, Sheerness*

— *elongata*, Curt. As the preceding. *Cobham Park*, plentiful in dry leaves under a log, October, 1889 (J. J. W.), *Greenwich, Gravesend, Bishop's Wood, Darenth Wood, Bearsted*

Corticaria pubescens, Gyll. (*punctulata*, Marsh.). In haystack refuse, moss, decaying seaweed, etc.; not uncommon

— *crenulata*, Gyll. As the preceding; not uncommon on the coast, rare inland

— *denticulata*, Gyll. As the preceding; rather local, but not uncommon

— *serrata*, Payk. In refuse, under bark, also in ants' nests; not common. *Darland Hill, Chatham*

INSECTS

LATHRIDIDÆ (continued)

- Corticaria umbilicata*, Beck. (cylindrica, Mann.). In moss; very local. *Chattenden, Strood, Shooters Hill*. Mr. Walker records it as being much less common than it used to be
- *fulva*, Com. I have a record of this species from 'Kent,' but I consider it to be doubtful
- *elongata*, Humm. In refuse, moss, etc.; generally distributed and common
- *fenestralis*, L. (*rufula*, Zett.). As the preceding; not common, and usually occurs singly. *Chattenden, Chatham, Darent Wood, Sevenoaks*
- Melanophthalma gibbosa*, Herbst. In moss, haystack refuse, etc.; abundant everywhere
- *transversalis* var. *wollastoni*, Wat. In moss, haystack refuse, etc., and also in and among rushes on the coast; rare, but plentiful sometimes where it occurs. *Sheerness, Darent Wood, Chatham, Kingsgate*. We do not apparently possess the type form in Britain
- *fuscata*, Humm. In moss, refuse, etc.; very common
- *fulvipes*, Com. (*curta*, Woll.). Sandy places on the coast, in decaying seaweed and at roots of grass; locally common

CUCUJIDÆ

- Pediacus dermestoides*, F. Under bark and in chinks of freshly cut oaks, etc.; very rare. *Cobham Park* (Walker)
- Læmophilæus bimaculatus*, Payk. Under bark of oak, beech and hornbeam; very rare. *Gore Court near Bearsted* (Gorham), *Bromley, Kent* (under oak bark)
- *duplicatus*, Waltl. Under bark of beech, oak, etc., also in fungus; very local, and as a rule rare. *Cobham Park*, rare in dry fungus; *Maidstone, Farnborough, Bromley* (in numbers)
- *pusillus*, Schön. In a granary at *Strood*; probably introduced
- *ferrugineus*, Steph. In haystack refuse, in granaries and under bark; common; probably introduced
- *ater*, Ol. In dead stems of broom; rare. *Darent Wood*
- *clematidis*, Er. In dead stems of *Clematis vitalba*; rare. *Gravesend* (Janson), *Dartford* (Champion)

CUCUJIDÆ (continued)

- Brontes planatus*, L. Under bark of dead beech trees; very rare. *Blackheath* (Douglas)
- Psammæchus bipunctatus*, F. Marshy places, in refuse, etc.; local. *Lee, Higbam, Rainham, Snodland, Strood, Bearsted, Wickham, Birchington, Folkestone*
- Silvanus surinamensis*, L. In sugar, in granaries, etc.; an introduced species; not uncommon. *Cobham Park*, by sweeping
- *unidentatus*, F. Under bark of oak, beech, etc.; local. *Cobham Park*
- *similis*, Er. Very rare; one specimen in a birch faggot, *Cobham Park* (J. J. W.). Mr. Champion has taken it abundantly at *Esher* in Surrey, but only in dead branches of Scotch fir

BYTURIDÆ

- Byturus sambuci*, Scop. On flowers; rather common
- *tomentosus*, F. On flowers, especially on raspberry blossoms; common

CRYPTOPHAGIDÆ

- Diphyllus lunatus*, F. In the black fungus and under bark of old ash trees; rare. *Chatham, Sheerness*
- Telmatophilus sparganii*, Ahr. In stems of *Sparganium*, *Typha*, etc.; rare. *Pegwell Bay, Hythe, Sandwich*
- *caricis*, Ol. In stems of *Typha*, also by sweeping in marshy places; common. *Snodland, Chatham, Sheerness, Lee, Hythe*
- *typhæ*, Fall. In stems of *Typha*, also in flood refuse, etc.; locally common. *Snodland, Chatham, Sheerness, Hythe*
- *schönherri*, Gyll. As the preceding; not uncommon. *Sheerness, Deal*
- *brevicollis*, Aubé. As the preceding; rare. *Sheerness, Birchington, Pegwell Bay, Sandwich, Hythe*
- Antherophagus nigricornis*, F. On flowers; also in and about nests of humble bees, and taken attached to the bees in flight; rather common
- *pallens*, Gyll. Often in and near humble bees' nests; rare. *Queen-down Warren, Chattenden, Cobham Park, Darent Wood, Folkestone, Dover, Birchington, Kingsgate*, etc.
- *silaceus*, Herbst. By sweeping; probably with humble bees; rare. *Darland Hill* (very rare), *Darent Wood, Gravesend, Deal, Folkestone*

A HISTORY OF KENT

CRYPTOPHAGIDÆ (continued)

- Cryptophagus lycoperti*, Herbst. In *Lycopodons*; locally common
- *setulosus*, Sturm. In fungi, refuse, etc., also in nests of humble bees; not uncommon and widely distributed
- *pilosus*, Gyll. In haystack bottoms, cut grass, etc.; often in hotbeds; common
- *punctipennis*, Bris. As the preceding; local
- *ruficornis*, Steph. In black fungus on old ash trees; usually rare. *Strood* (Champion), *Cobham Park*. It has been taken in some numbers at *Strood* by Mr. J. J. Walker since Mr. Champion recorded it
- *populi*, Payk. In fungi, rotten wood, etc., also about the burrows of bees' nests, especially *Colletes daviesiana*; local and usually rare. *Sydenham*, *Margate*
- *saginitus*, Sturm. In fungi, refuse; local. *Sheerness*, *Gravesend*
- *umbratus*, Er. In haystack refuse, etc.; rare. *Plumstead*, *St. Peter's (Isle of Thanet)*
- *scanicus*, L. As the preceding; common everywhere
var. *patruelis*, Sturm. With the type form, but much rarer
- *badius*, Sturm. As the preceding; not common. *Sheerness*, *Darent*, *Lee*, *Gravesend*, *Tonbridge*, *Folkestone*
- *dentatus*, Herbst. As the preceding; very common
- *distinguendus*, Sturm. As the preceding; not uncommon, but local
- *acutangulus*, Gyll. As the preceding; local. *Sheerness*, *Lee*, *Deal*
- *fumatus*, Gyll. In cellars, etc.; very rare. *Deal*
- *cellaris*, Scop. In refuse, haystack bottoms, etc.; not uncommon. *Cobham Park*, *Rochester*, *Sheerness*, *Gravesend*
- *affinis*, Sturm. As the preceding and also in fungi; not uncommon in some localities. *Cobham Park*, scarce
- *pubescens*, Sturm. In moss and haystack refuse; local. *Chatham*, *Cobham Park* (attached to wasps' nests)
- *bicolor*, Sturm. In haystack refuse, etc.; not common. *Sheerness*, *Strood*
- Micrambe vini*, Panz. On the flowers of gorse and broom, also in stable refuse; common everywhere
- Paramecosoma melanocephalum*, Herbst. On sallows, in flood refuse, etc.; rare. *Chatham*

CRYPTOPHAGIDÆ (continued)

- Cænoscels pallida*, Woll. Evening sweeping, also in runs of *Formica fuliginosa*; rare. *Chatham*, *Cobham Park*
- Atomaria barani*, Bris. Marshy places, at roots of grass and in flood refuse; rare. *Eltham*, *Lee*
- *nigriventris*, Steph. (*nana*, Er.). Very common
- *umbrina*, Er. In moss, dead leaves, refuse, etc.; local. *Lee*, *Darent*, *Wood*
- *linearis*, Steph. As the preceding; common everywhere
- *badia*, Er. In dead branches of Scotch fir; rare. *Gravesend* (Power), *Dover* (Hall)
- *fuscipes*, Gyll. In haystack refuse, manure heaps, and under seaweed near the coast; local. *Sheerness*, *Chatham*, *Deal*
- *peltata*, Kr. In haystack and vegetable refuse; rare. *Chatham*, *Cobham Park*, *Sheerness*
- *munda*, Er. As the preceding; local. *Strood*, *Sheerness*, *Lee*, *Cowley*
- *impressa*, Er. As the preceding; very rare. *Lee*, one specimen (Sharp)
- *fuscata*, Sch. As the preceding; local
- *atra*, Herbst. Damp places, by sweeping; very rare. *Leigh*, one specimen (Miss Shepherd)
- *pusilla*, Payk. In moss, haystack refuse, by evening sweeping, etc.; local. *Sheerness*, *Lee*
- *atricapilla*, Steph. As the preceding; very common
- *berolinensis*, Kr. As the preceding; local. *Sheerness*, *Lee*, *Sevenoaks*, *Whitstable*, *West Wickham*, *Tonbridge*
- *basalis*, Er. In vegetable refuse; very scarce. *Darent*, *Wood*
- *mesomelinus*, Herbst. Marshy places, in flood refuse and at roots of grass; locally abundant. *Sheerness*, *Higham*, *Snodland*, *Eltham*
- *gutta*, Steph. As the preceding; locally abundant. *Sheerness*, *Chatham*, *Rochester*, *Maidstone*, *Birchington*
- *apicalis*, Er. In haystack and other refuse, hotbeds, etc.; local. *Lee*, *Chatham*
- *analís*, Er. As the preceding; locally common
- *ruficornis*, Marsh. Very common
- *versicolor*, Er. In sheep dung; rare. *Shooters Hill*
- Ephistemus globosus*, Waltl. In haystack refuse, in dung, under bark, etc.; rare. *Snodland*, *Lee*, *Cowley*, *Charlton*

INSECTS

CRYPTOPHAGIDÆ (continued)

- Ephistemus gyrinoides*, Marsh. In haystack refuse; common everywhere
 — *globulus*, Payk. As the preceding; rare. *Sheerness*; perhaps a variety of *E. gyrinoides*

SCAPHIDIIDÆ

- Scaphidium quadrimaculatum*, Ol. In rotten stumps, logs, fungi, etc.; not uncommon. *Cobham Park, Darent Wood*
Scaphisoma agaricinum, L. As the preceding; not uncommon. *Chatham, Sheerness, Whitstable, Darent and Birch Woods*, etc.
 — *boleti*, Panz. As the preceding; not common. *Snodland, Whitstable, Birch Wood, Bishop's Wood*

MYCETOPHAGIDÆ

- Typhæa fumata*, L. In haystack refuse and granaries; common everywhere
Triphyllus suturalis, F. In fungi on old trees; not common. *Sheerness*
 — *punctatus*, F. As the preceding; common
Litargus bifasciatus, F. Under bark of beech and other trees; local. *Darland Hill, Boxley, Westerham, Maidstone*
Mycetophagus quadripustulatus, L. In fungi, rotten wood, etc.; common and generally distributed
 — *piceus*, F. In fungi on old trees and in damp logs; very rare. *Cobham Park, Lee*
 — *atomarius*, F. Under loose dry beech bark; locally common. *Chatham, Queendown Warren, Holly Hill, Wigmore Wood, Brasted, Sevenoaks, Westerham, Farnborough*, etc.
 — *quadriguttatus*, Müll. In decayed ash, cut grass, haystack bottoms, granary refuse, etc.; rare. *Cobham Park, Dartford, Sheerness*
 — *multipunctatus*, Hellw. In fungi on trees, under bark, etc.; very local. *Sheerness, Darent Wood, Sandwich* (abundant, *Gorham*)

DERMESTIDÆ

- Dermestes vulpinus*, F. In hides, furs, etc.; only too common
 — *frischii*, Kug. In dead animals, etc.; rare. *Greenwich, Deal*
 — *murinus*, L. In small dry carcases (birds, mice, moles, etc.); common
 — *undulatus*, Brahm. In dead birds, fish, etc.; usually on the coast; local, but widely distributed
 — *lardarius*, L. In skins, bacon, dead

DERMESTIDÆ (continued)

- animals, etc.; far too common in houses and warehouses, rarer out of doors
Attagenus pello, L. In skins, furs, natural history specimens, etc.; common
Megatoma undata, Er. In skins and furs, also on palings, under bark, and even in flowers; very local and usually rare. *Lewisham, Lee, Darent*
Tiresias serra, F. Under dry bark; rare. *Greenwich, Cobham Park, Sheerness*
Anthrenus varius, F. In natural history specimens, also on flowers; not common. *Lee, Cowley, Dover*, etc.
 — *musæorum*, L. As the preceding; too common
 — *claviger*, Er. On flowers; local. *Sheerness, Chatham district, Darent Wood*

BYRRHIDÆ

- Syncalypta spinosa*, Rossi. In chalky places, at roots of grass, in moss, etc.; locally common at times, but as a rule rare. *Darland Hill, Cuxton, Snowledge Bottom, Sheerness, Faversham, Deal, Folkestone*
 — *hirsuta*, Sharp. As the preceding; locally common. *Darland Hill, New Brompton, Higham, Cuxton, Faversham, Farnborough, Deal, Folkestone*
Byrrhus pilula, L. At roots of grass, in moss, etc.; generally common
 var. *dennyi*, Steph. Sandy and chalky places; at roots of *Teucrium scorodonia*; rare. *Tunbridge Wells, Cowley*
 — *fasciatus*, F. Sandy places; not uncommon, but very local. *Chattenden, Whitstable, Sheerness*
 — *dorsalis*, F. Sandy places; rare. *Plumstead, Cowley, West Wickham, Belvedere, Dover*
 — *murinus*, F. At roots of heath, in moss, etc.; rare. *Plumstead*
Cytilus varius, F. Damp places, in moss, at roots of grass; local. *Chattenden, Wigmore Wood, Sheerness*
Simplocaria semistriata, F. In flood refuse, moss, etc.; common.
Limnichus pygmæus, Sturm. Sandy and chalky places, in moss, etc.; rare. *Higham, Sheerness, Sheppey, Deal*
Aspidiphorus orbiculatus, Gyll. In brown powdery fungus or rotten wood; rare. *Cobham Park, Wigmore Wood, Bishop's Wood, Darent Wood, Faversham*

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PARNIDÆ

- Elmis æneus*, Müll. In running water, clinging to stones, logs, or bits of wood; locally common
- *volkmari*, Panz. As the preceding; rare. *Maidstone*
- Limnius tuberculatus*, Müll. In running water; locally common. *Lewisham*; probably widely distributed.
- *rivularis*, Rosenh. In running water; rare. *Birchington* near *Margate*
- Parnus prolifericornis*, F. Pond sides, under stones in damp places, etc.; generally distributed and common
- *auriculatus*, Ill. As the preceding; local and not uncommon as a rule. *Snodland* (scarce), *Lee*, *Faversham*
- Heterocerus femoralis*, Kies. Banks of ponds and ditches; not common. *Sheerness*, *Gravesend*, *Deal*
- *obsoletus*, Curt. Banks of brackish ditches; sometimes in tidal refuse and seaweed; local. *Gravesend*, *Rochester*, *Chatham*, *Sheerness*
- *marginatus*, F. Banks of ponds and ditches; not uncommon, especially near the coast. *Lee*, *Sheerness*, *Rainham*, *Gravesend*, *Whitstable*, *Maidstone*
- *lævigatus*, Panz. Banks of ponds and ditches; local. *Lee*, *Darenth Wood*
- *britannicus*, Kuwert. (sericans, *Brit. Col.*; nec Kies). Rare. *Gravesend*, *Sheerness*, *Pegwell Bay*

LUCANIDÆ

- Lucanus cervus*, L. On trunks of trees and flying at dusk about midsummer; common and generally distributed
- Dorcus parallelipedus*, L. In decaying ash trees; rather common
- Sinodendron cylindricum*, L. In rotten wood of ash, beech, willow, etc.; not uncommon

SCARABÆIDÆ

- Copris lunaris*, L. Sandy places; in dung; local, and as a rule rare. *Greenwich*, *Charlton*, *Bexley*, *Chatham*, *Birch Wood*, *Sittingbourne*
- Onthophagus nutans*, F. In dung; rare. *Darenth Wood*
- *ovatus*, L. In dung and decaying fungi; generally distributed and common
- *cœnobita*, Herbst. In dung; common as a rule
- *vacca*, L. In dung; common
- *fracticornis*, Payk. In dung; local; found especially near the coast. *Whitstable*, *Deal*, *Dover*
- *nuchicornis*. In dung; local. *Green-*

SCARABÆIDÆ (continued)

- wich*, *Gravesend*, *Whitstable*, *Belvedere*, *Cobham Park* (scarce, in deer's dung), *Deal*
- Aphodius erraticus*, L.¹ Common
- *subterraneus*, L. Local, but not uncommon
- *fossor*, L. Very common
- *hæmorrhoidalis*, L. Common
- *foetens*, F. Not common. *St. Peter's (Isle of Thanet)*, *Pegwell Bay*, *Folkestone*, *Dover*
- *fimetarius*, L. Common everywhere
- *scybalarius*, F. Common
- *ater*, De G. Common and generally distributed
- *constans*, Duft. Rare. *Belvedere* (T. Wood)
- *granarius*, L. Very common throughout the county
- *nitidulus*, F. Not very common. *Darenth Wood*, *Plumstead*, *Sandwich*, *Deal*
- *sordidus*, F. Rare. *Greenwich*, *Belvedere*, *Plumstead*
- *rufescens*, F. Local. *Greenwich*, *Whitstable*, *Belvedere*, *Cobham Park*, *Tonbridge*, *Pegwell Bay*, *Hythe*, *Dover*
- *putridus*, Sturm. Rare. *Cobham Park*, *Tonbridge*
- *plagiatus*, L. Under stones, in flood refuse, etc.; rarely in dung; locally common. *Sheerness*, *Deal*, *Dover*
- *lividus*, Ol. Very local. *Lee*, *Darenth Wood*, *Greenwich*, *Sittingbourne*, *Kingsgate* (in abundance, T. Wood)
- *porcus*, F. Not common. *Chatham Lines*, *St. Peter's (Isle of Thanet)*, *Kingsgate*, *Ramsgate*
- *tristis*, Panz. Very local. *Whitstable*
- *pusillus*, Herbst. Somewhat local, but by no means uncommon
- *merdarius*, F. Generally distributed and common
- *inquinatus*, F. Local. *Birch and Darenth Woods*, *Chatham*, *Deal*
- *tessulatus*, Payk. Rare. *Darland Hill*, *Walderslade*, *Chatham*, *Tunbridge Wells*, *Kingsgate*, *Broadstairs*, *Deal*, *Folkestone*
- *sticticus*, Panz. Very local. *Belvedere*, *Tonbridge*, *Darenth Wood*
- *consputus*, Cr. Very local and usually rare. *Gravesend*, *New Brompton*,

¹ All the species of *Aphodius* are found in dung of various animals; also in hotbeds and manure heaps, and very often on the wing in numbers.

INSECTS

SCARABÆIDÆ (continued)

- Chatham, Broadstairs, Kingsgate, Ashford.* Mr. Walker records it as abundant in *Sheppey* in late autumn and early spring
- Aphodius punctato-sulcatus*, Sturm. Common everywhere
- *prodromus*, Brahm. Common
- *contaminatus*, Herbst. Common everywhere
- *obliteratus*, Panz. Local. *Birch Wood, Darent Wood, Cobham Park, Tonbridge*
- *zenkeri*, Germ. Local and rare. *Cobham Park, Sevenoaks*
- *luridus*, F.¹ Local, but not uncommon. *Whitstable, Queendown Warren, Cobham Park*
- *rufipes*, L. Very common everywhere
- *depressus*, Kug. Local. *Chatham.* The typical red variety is extremely rare
- Heptaulacus sus*, Herbst. Sandy places, in dung; local. *Deal, Sandwich*
- *villosus*, Gyll. Sandy and chalky places; by sweeping, etc. Considered one of the rarest British beetles until Dr. Sharp and Mr. Walker took it in great profusion by sweeping in a very limited grassy spot on the south side of *Cobham Park*, on 20 June, 1889
- Oxymus porcatus*, F. In vegetable refuse, hotbeds, etc.; not uncommon and widely distributed
- Pssamobius sulcicollis*, Herbst. On the coast; in and on the sand, occasionally under seaweed; rare. *Deal, Dover*
- Ægialia arenaria*, F. On the coast; probably common, but I only have a record from *Deal*
- Odontæus mobilicornis*, F. In dung; usually taken on the wing; very rare. *Darent Wood, Birch Wood, Charlton, Dartford*
- Geotrupes typhæus*, L. Under cow dung. *Greenwich*, and probably general
- *spiniger*, Marsh. In dung; generally distributed and common
- *stercorarius*, L. In dung; generally distributed and common
- *mutator*, Marsh. In dung; generally distributed and common
- *sylvaticus*, Panz. In dung; generally distributed and common
- *vernalis*, L. Local. *Greenwich, Plumstead, Belvedere*, etc.

¹ The entirely black variety is not uncommon in Cobham Park and neighbourhood.

SCARABÆIDÆ (continued)

- Geotrupes pyrenæus*, Charp. Sandy heaths; very local and rare. *Belvedere*
- Trox sabulosus*, L. Sandy places; in dry carcasses, rams' horns, etc.; rare. *Sundridge, Dover*
- *scaber*, L. In dry carcasses, hides, bones, etc.; local. *Blackheath, Tonbridge*
- Hoplia philanthus*, Füss. On flowers, etc.; local, but usually common where it occurs. *Chatham, Lee, West Wickham, Sheerness, Tonbridge, Pegwell Bay, Dover*, etc.
- Homalophia ruricola*, F. The black variety is very rare. On flowers; as a rule rare. *Cobham Great Wood, Queen-down Warren, Horsted, Darent Wood, Dover, Sandwich* (in numbers, and also a black variety, C. O. Waterhouse)
- Serica brunnea*, L. By sweeping; also on or about poplars and birch; local. *Sevenoaks, Lee*, etc. *Rochester* district, not common
- Rhizotrogus solstitialis*, L. Generally distributed and often in profusion, flying about trees at dusk
- Melolontha vulgaris*, F. About trees, flying at dusk; generally distributed and often in great abundance. Mr. Walker records it as 'decidedly less abundant now than in former years' in the *Rochester* district
- [*Polyphylla fullo*, F. All the known British specimens up to Stephens' time were recorded as taken between *Hythe* and *Ramsgate*, chiefly in the neighbourhood of *Deal* and *Sandwich*. One has occurred at *Belvedere, Kent*, since, but the species is certainly not indigenous]
- Phyllopertha horticola*, L. On flowers, young trees, etc.; common
- Anomala frischei*, F. Sandy places, usually on the coast; not uncommon at *Deal*, and probably widely distributed
- Cetonia aurata*, L. On flowers; generally distributed and common
- Gnorimus nobilis*, L. On flowers and in orchards, in the rotten wood of trees, etc.; very rare. One specimen, road between *Farningham* and *Darent Wood*, 1896 (R. W. Lloyd)

BUPRESTIDÆ

- Agrilus biguttatus*, F. Found flying about and settling on oak stumps and felled timber; in clearings in woods; very local. *Darent Wood* (in some numbers, Power and Champion)
- *laticornis*, Ill. By beating young hazel,

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BUPRESTIDÆ (continued)

- oak, birch, etc.; very local. *Darent Wood*
- Agrilus angustulus*, Ill. As the preceding; very local. *Darent Wood*
- Aphanisticus pusillus*, Ol. By sweeping, in moss, etc.; rare. *Chattenden, Strood, Deal, Folkestone*
- Trachys minuta*, L. On willows and hazels; local. *Chattenden, Chatham, Darent Wood*
- *pumila*, Ill. By sweeping short herbage; in moss and at roots of *Marrubium vulgare*, etc.; very rare. *Cobham Park*, eight examples in 1897-8
- *troglodytes*, Gyll. In moss and on flowers; rare. *Cuxton*, one specimen (J. J. W.); *Chatham; Folkestone* (Waterhouse)

THROSCIDÆ

- Throscus dermestoides*, L. Often commonly found by evening sweeping; generally distributed and common
- *carinifrons*, Bonv. By evening sweeping; very local. *Cobham Park, Chattenden, St. Mary's Island* (rather plentiful, J. J. W.), *Sheppey, Chislehurst, Tonbridge* (in numbers, A. C. Horner)
- *elateroides*, Heer. At roots of grass; often in salt marshes, and by evening sweeping; very local. *Rainham, St. Mary's Island, Chatham, Sheerness, Cowley*
- *obtus*, Curt. In moss, haystack refuse, etc.; not common as a rule and very local, but occasionally in numbers. *Lee, Sheerness, Darland Hill, Chatham*

EUCNEMIDÆ

- Melasis buprestoides*, L. In decaying beech and hornbeam; local. *Cobham Park*, sometimes plentiful (J. J. W.); *Sevenoaks, Darent Wood, Tonbridge*

ELATERIDÆ

- Lacon murinus*, L. On grassy hillsides, under stones, etc.; common
- Cardiophorus asellus*, Er. Sandy places, at roots of grass and by sweeping; very local and as a rule rare. *Faversham, Darent Wood, Birch Wood*
- Cryptohypnus quadripustulatus*, F. Damp grassy places; scarce. *Lee, Cowley*
- Elater sanguinolentus*, Schr. At roots of heath, on nettle flowers, etc.; rare. *Darent Wood*
- *pomonæ*, Steph. Very rare. *Darent Wood* (Stephens), but this record requires confirmation
- *elongatulus*, F. In decaying oaks; very rare. *Darent Wood* (Power)

ELATERIDÆ (continued)

- Elater balteatus*, L. On birches; occasionally in rotten wood of oak and birch; not uncommon. *Darent Wood, Birch Wood, Abbey Wood, Shooters Hill*, and probably general
- Ischnodes sanguinicollis*, Panz. In rotten wood and fungus; rare. *Greenwich, Blackheath, Sheerness*
- Ludius ferrugineus*, L. In decayed trees; very rare. *Darent Wood*; the species has not been taken for many years
- Melanotus punctolineatus*, Pel. Sandy places, at roots of grass, etc.; rare. *Pegwell Bay, Deal, Dover*
- *rufipes*, Herbst. In rotten wood and on the wing; common
- var. *castanipes*, Payk. In rotten wood; rare. *Cobham Park* (J. J. W.), *Tonbridge* (Horner)
- Athous rhombeus*, Ol. In decaying trees and logs; also on bracken; very rare. *Cobham Park*, one specimen, (H. A. Maling)
- *niger*, L. By sweeping in woods; not uncommon
- *longicollis*, Ol. By sweeping in woods; not uncommon
- *difformis*, Lac. By sweeping, especially at night; not common. *Eastry* (Gorham); *Ramsgate*, in alders (Stephens); *Sandwich* (Waterhouse); *St. Peter's, Isle of Thanet* (T. Wood); *Deal* (Hull)
- *hæmorrhoidalis*, F. On bracken, hazels, birches, etc.; very common throughout the kingdom
- *vittatus*, F. As the preceding, but local. *Darent Wood*
- Limoni* *cylindricus*, Payk. By sweeping in damp places; rare. *Birch Wood*
- *minutus*, L. On flowers, etc.; local, but not uncommon
- Adrastus limbatus*, F. By sweeping in grassy places in woods; local. *Sheerness, Chatham, Sevenoaks*
- *pusillus*, F. By sweeping long coarse grass in open ground. *Sandwich* (E. A. Waterhouse), *Deal* and *Dover* (Hall)
- Agriotes sputator*, L. Under stones, at roots of grass, etc.; common and generally distributed
- *obscurus*, L. As the preceding; very common
- *lineatus*, L. As the preceding; very common
- *sordidus*, Ill. Sandy coasts and banks of rivers, under stones and in flood refuse; very local and usually rare.

INSECTS

ELATERIDÆ (continued)

- Chatham, Strood, Sheerness* (in numbers), *Sheppey*
Agriotes sobrinus, Kies. By beating and sweeping in woods; rather local.
Chatham, Darent Wood
 — *pallidulus*, Ill. As the preceding; common
Dolopius marginatus, L. As the preceding; local. *Darent Wood, Chatham*
Corymbites quercus, Gyll. By sweeping and beating; not common. *Birch and Darent Woods, Belvedere*
 — *holosericeus*, F. By sweeping, under stones, etc.; local. *Darent Wood, Lee*
 — *æneus*, L. Grassy places; rare. *Belvedere, West Wickham, Birch Wood*
 — *metallicus*, Payk. By sweeping bracken, etc.; sometimes on fallows; rare. *Darent Wood*
 — *bipustulatus*, L. In decaying willow; also by sweeping. *Tonbridge, Sandwich*
Campylus linearis, L. By beating and sweeping in woods; not rare

DASCILLIDÆ

- Dascillus cervinus*, L. In chalky places, on flowers; local, and sometimes plentiful
Helodes minuta, L. In damp places by sweeping; also on fallows and alder; local, but not rare
Microcara livida, F. By sweeping; also on hawthorn; local. *Chatham, Sheerness, Lee, Darent Wood*
Cyphon coarctatus, Payk. By sweeping in damp places; rare. *Snodland, Chattenden, Sheerness*
 — *nitidulus*, Thoms. As the preceding; rather common
 — *variabilis*, Thunb. As the preceding; common
 — *pallidulus*, Boh. As the preceding; rather common, but local. *Lee, Chatham, Chattenden, Snodland, Sheerness, Tonbridge*
 — *padi*, L. As the preceding; local. *Lee, Chattenden, Snodland, Dover*
Prionocyphon serricornis, Müll. By sweeping; also in decaying logs; very rare. *Darent Wood, Birch Wood, Cobham Park*
Scirtes hemisphæricus, L. Marshy places; on sallow and alder; local. *Tonbridge, Pegwell Bay, Deal*
 — *orbicularis*, Panz. As the preceding; very local and usually rare. Near *Cliffe* (in numbers), *Gravesend, Sheerness, Deal*

LYCIDÆ

- Platycis minutus*, F. In or on old stumps of fir and ash; very rare. *Cobham Park, Birch Wood, Darent Wood, Ashford, Tunbridge Wells, Sandwich*

LAMPYRIDÆ

- Lampyrus noctiluca*, L. On grassy and mossy banks; the male often flies to light; somewhat local, but more or less common
Silis ruficollis, F. By sweeping; very rare; a pair on rushes, *Snodland*, 20 June, 1895 (J. J. W.)

TELEPHORIDÆ

- Podabrus alpinus*, Payk. On various trees; locally common. *Darent Wood*
Telephorus fuscus, L. By sweeping *Umbelliferæ*, etc.; local. *Gravesend, Snodland, Chattenden, Dartford*
 — *rusticus*, Fall. On flowers and shrubs; common everywhere
 — *lividus*, L. On flowers and shrubs; common everywhere
 var. *dispar*, F. Rare. *Folkestone*
 — *pellucidus*, F. On flowers and shrubs; local. *Darent Wood, Chatham district, common*
 — *nigricans*, Müll. On flowers in woods and lanes; local. *Darent Wood, Chatham district*
 var. *discoideus*, Steph. Not uncommon. *Darent Wood, Chatham district, Whitstable*, etc.
 — *lituratus*, Fall. Chiefly on *Umbelliferæ*; rather common
 — *figuratus*, Mann. On hawthorn blossom. *Chattenden and Snodland*, not rare; not however a common insect
 — *bicolor*, F. On flowers, oaks, etc.; common
 — *hæmorrhoidalis*, F. Chiefly on hawthorn blossoms; local. *Rochester district, Darent Wood, Lee*
 — *oralis*, Germ. On flowers, etc., especially near the coast; local. *Rochester district, Gravesend, Lee, Sheerness, Whitstable, Deal*
 — *flavilabris*, Fall. On flowers, etc.; generally distributed and common
 — *thoracicus*, Ol. By sweeping in marshy places, on osiers, etc.; very local. *Sydenham, Belvedere, Tonbridge, Pegwell Bay, Dover*
Rhagonycha unicolor, Curt. By sweeping long grass in woods; rare. *Cobham Park, Snodland, Cuxton, Queendown Warren, Darent Wood, Sevenoaks, Maidstone*
 — *fuscicornis*, Ol. Chiefly on hawthorn blossoms in woods; local, but not

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TELEPHORIDÆ (continued)

- rare. *Rochester* district, *Darenth Wood*, *Lee*, *Sevenoaks*, *Dover*
- Rhagonycha fulva*, Scop. Chiefly on *Umbelliferæ*; very common everywhere
- *testacea*, L. On flowers, etc., especially hawthorn blossom; in damp places; not common. *Rochester* district, *Tonbridge*
- *limbata*, Thoms. By sweeping; very common
- *pallida*, F. Chiefly in woods; common
- Malthinus punctatus*, Fourc. In woods; rather common
- *fasciatus*, Ol. In woods; rather common
- *balteatus*, Suffr. In woods; rather common
- *frontalis*, Marsh. By beating and sweeping under fir trees; not common. *Cobham Park*, *Birch Wood*
- Malthodes marginatus*, Latr. By beating and sweeping in woods; common
- *mysticus*, Kies. By beating and sweeping; rare. *Tonbridge*
- *flavoguttatus*, Kies. By sweeping in a damp thicket at *Snodland*, rare (J. J. W.)
- *dispar*, Germ. By beating and sweeping in or near woods; rare. *Darenth Wood*
- *pellucidus*, Kies. On young birches, grass, etc.; rare. *Sevenoaks*
- *minimus*, L. In damp places, by sweeping; common
- *atomus*, Thoms. In or near woods; local; scarce in the *Rochester* district; rather common in some places. *Lee*, *Sevenoaks*, *Darenth Wood*, *Folkestone*, etc.

MELYRIDÆ

- Malachius æneus*, L. On flowers, especially in woods, etc.; local. *Chatham*, *Chatenden*, *Lee*, *Sheerness*, *Darenth Wood*, *Belvedere*, *Tonbridge*
- *bipustulatus*, L. By general sweeping; common everywhere
- *viridis*, F. As the preceding; rather common and widely distributed
- *marginellus*, Ol. On flowers, mostly on the coast; locally common. *Snodland* and *Cobham Park*, rare; *Whitstable*, *Birchington*, *Folkestone*, *Deal*
- Axinotarsus pulicarius*, F. On *Umbelliferæ*; rare. *Charlton*
- *ruficollis*, Ol. By sweeping; locally common. *Beckenham*, *Erith*, *Tonbridge*, etc.
- Anthocomus fasciatus*, L. By sweeping; on *Umbelliferæ*; sometimes on salwos and willows; local, but widely distributed

MELYRIDÆ (continued)

- Dasytes flavipes*, F. (plumbeus, Müll). By sweeping herbage in lanes and woods; not uncommon
- *oculatus*, Kies. As the preceding; rare. *Cobham Park* under oaks, *Chatham*, *Darenth Wood*
- *ærosus*, Kies (plumbeo-niger, Goeze). Local, but not uncommon
- Psilothrix nobilis*, Ill. On flowers, especially of *Hieracium*, on the coast; locally common. *Whitstable*, *Herne Bay*, etc.
- Dolichosoma lineare*, Rossi. Grassy banks on the coast; local, but not uncommon. *Sheerness*, *Deal*
- Haplocnemus impressus*, Marsh. Under bark of elm, oak, pear, etc.; rare. *Sheerness*
- Phlæophilus edwardsi*, Steph. Under bark and in rotten wood; also by sweeping; rare. *Cobham Park*, *Tonbridge*, *Maidstone*

CLERIDÆ

- Tillus elongatus*, L. On decaying wood; sometimes on elder blossom. *Cobham Park*, *Sydenham*, *Darenth Wood*, *Tonbridge*
- Opilo mollis*, L. By sweeping and beating dead hedges; as a rule rare. *Upnor*, *Darland Hill*, *Lee*, *Darenth Wood*, *Chatham*, *Sheerness*, *Whitstable*
- Tarsostenus univittatus*, Rossi. On flowers, etc. *Winchmore Hill*, *Kent*. Two specimens recorded by Stephens and Curtis. It has recently been found in some numbers at *Harwich* by Mr. Whitaker
- Thanasimus formicarius*, L. Under bark of felled trees, especially fir; very local. *Sheerness*, *Maidstone*, *Bearsted*, *Deal*, *Walmer*, *Dover*
- Necrobia ruficollis*, F. In carcasses, old bones, etc. Common
- *violacea*, L. In dry carcasses; also on flowers. *Darland Hill*, etc. *Rochester* district, not rare (J. J. W.). I can find no other record
- *rufipes*, De G. In old bones and carcasses; local. *Greenwich*, *Sheerness*
- Corynetes cœruleus*, De G. In old bones, etc.; also on flowers; local, but widely distributed, and occasionally common

DRILIDÆ

- Drilus flavescens*, Rossi. By sweeping in chalky places where snails occur plentifully; male not uncommon locally; female extremely rare. *Rochester* district, *Strood*, etc.; *Darenth Wood*, *Ashford*, *Dover*, *Folkestone*

INSECTS

PTINIDÆ

Ptinus germanus, F. In old posts; rare. *Orpington* (Power)

— *sexpunctatus*, Panz. In old wood; sometimes in houses; rare. *Blackbeath*

— *fur*, L. In old wood, often in houses; far too common

— *subpilosus*, Müll. In rotten wood and small carcasses; sometimes with ants; very rare. *Cobham Park*, one example (J. J. W.)

[— *pilosus*, Müll. Said to have been taken at *Chatbam*, but probably in error]

Niptus hololeucus, Fald. In old houses, cupboards, etc.; generally distributed

Hedobia imperialis, E. In old hedges, sometimes on the wing; not common. *Darent Wood, West Wickham, Cobham Park, Darland Hill, Faversham, Tonbridge, Deal*

ANOBIIDÆ

Dryophilus pusillus, Gyll. By sweeping under fir trees; local and usually scarce. *Darland Hill, Cobham Park, Birch Wood, Faversham*

— *anobioides*, Chev. In old stumps of broom, also bred from dead bramble sticks; very rare. *Plumstead, Maidstone*

Priobium castaneum, F. In dead hedges, decayed hornbeam, old posts, etc.; rather common

Anobium denticolle, Panz. In old oak trees; very rare. *Erith*, on an old fence (Power)

— *domesticum*, Fourc. In old wood, in houses, old buildings, hedges, etc.; only too common

— *fulvicorne*, Sturm. In dead hedges; common

— *paniceum*, L. A common introduced species, found in old flour, bread, biscuit and other stores

Xestobium tessellatum. In old wood of willow and oak; also in houses; common and generally distributed

Ernobius mollis, L. In old posts; also under fir trees; local. *Sheerness, Cobham Park, Lee, Whitstable*

Ptilinus pectinicornis, L. In old posts; also in decaying oak, willow and hornbeam; not uncommon

Ochina hederæ, Müll. In old ivy; not uncommon

Xyletinus ater, Panz. In decayed wood; very rare. *Charlton* (Janson), *Tonbridge* (Horner)

ANOBIIDÆ (continued)

*Cœnocara bovis*æ, Hoff. In *Lycoperdons*; rare. *Bearsted, Tonbridge, Deal*

Dorcatoma chrysomelina, Sturm. In decayed oak trees; very rare. *Tonbridge* (Horner)

— *flavicornis*, F. In fungi on trees; very rare. *Cobham Park*, 1889 and 1895 (J. J. W.)

BOSTRICHIDÆ

Dinoderus substriatus, Payk. Very rare. *Darent Wood*, one example (G. Lewis)

Rhizopertha pusilla, F. An introduced species; found in old stores, on walls of oil mills, etc.

LYCTIDÆ

Lyctus canaliculatus, F. On oak palings, under bark, etc.; locally common

— *brunneus*, Steph. On oak palings and in oak stumps; very rare. *Cobham Park*, one specimen, July, 1889 (J. J. W.)

SPHINDIDÆ

Sphindus dubius, Gyll. In powdery fungus on old wood; rare. *Cobham Park, Chatbam*

CISIIDÆ

Cis boleti, Scop. In *boleti*, especially *Poly-pori*, on the bark of rotten trees; very common

— *villosulus*, Marsh. In *boleti*, also under bark of willow; locally common. *Rochester district, Chatbam, Gravesend, Darent Wood*

— *micans*, Herbst. In *boleti*, etc.; not common. *Darland Hill, Chatbam, Gravesend, Hawkhurst, West Wickham*

— *hispidus*, Payk. In *boleti*; local. *Halling Downs* (common), *Chatbam, Cuxton, Darent Wood*

— *bidentatus*, Ol. In *boleti*; not uncommon

— *alni*, Gyll. In *boleti*, also on old stumps; local, and as a rule rare. *Darent Wood, Hawkhurst, Cobham Park* (under dead boughs lying on the ground)

— *nitidus*, Herbst. In *boleti*; common

— *pygmæus*, Marsh. In *boleti*, on decaying hornbeam and other trees. *Cobham Park*, not rare (J. J. W.); *Tonbridge*, as a rule rare

— *festivus*, Panz. In *boleti* and dead boughs; rare. *Cobham Park, Darland Hill, Whitstable*

— *fuscatus*, Mell. In *boleti*; very local; bred in abundance from hard white fungus on oak. *Cobham Park*, 1896-7 (J. J. W.)

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CISSIDÆ (continued)

- Cis bilamellatus*, Wood. In boleti and under wood; taken in profusion by the Rev. T. Wood at *West Wickham Wood*; not recorded from any other locality, either British or foreign
- Ennearthron affine*, Gyll. In small boleti on old trees and stumps; common
- *cornutum*, Gyll. In fungoid growth on trees; as a rule very scarce. *Cobham Park, Chatham, Sheerness, Darenth Wood, Hawkhurst, West Wickham* (in numbers, T. Wood)
- Octotemnus glabriculus*, Gyll. In boleti, on old stumps, etc.; common

PRIONIDÆ

- Prionus coriarius*, L. On trunks of oak trees, also in decaying trees; rare. *Cobham Park, Sevenoaks, Belvedere, Tonbridge, Folkestone*

CERAMBYCIDÆ

- Aromia moschata*, L. In decaying willows; common
- Hylotrupes bajulus*, L. In old posts, etc.; very rare. *Belvedere* (T. Wood), *Deal*
- Callidium violaceum*, L. In decaying fir posts, etc.; local. *Darenth Wood*
- *variabile*, L. In decaying trees, occasionally at 'sugar'; rare. *Blackheath, Sydenham* in numbers (Power), *Lee, Cobham Great Wood, Frindsbury, Sheerness, Tonbridge, Dover*
- *alni*, L. In dead hedges, faggots, in woods, on flowers, etc.; local
- Clytus arcuatus*, L. In decaying trees, old posts, etc.; rare. *Chislehurst* (Stephens), *Greenwich* (West)
- *arietis*, L. In old posts and on shrubs; common
- *mysticus*, L. On hawthorn blossom, also in old posts and dead hedges; local but not uncommon
- Gracilia minuta*, F. In dead twigs, old hedges, baskets, etc.; locally common
- Molorchus umbellatarum*, L. On hawthorn blossom, etc., also in dead hedges; rare. *Darenth Wood, Sydenham, Whitstable*
- [*Cerambyx cerdo*, L. Has occurred at *Deptford*, but is plainly not indigenous]
- Rhagium inquisitor*, F. In decaying trees, also on flowers; common
- *bifasciatum*, F. In decaying trees; local, but not uncommon
- Toxotus meridianus*, Panz. On *Umbelliferæ*, in woods; not uncommon

CERAMBYCIDÆ (continued)

- Pachyta collaris*, L. On *Umbelliferæ*, especially in and near hop-gardens; local but usually common where it occurs. *Cobham Park, Chattenden, Wigmere Wood, Bexley, Shooters Hill, Darenth Wood, Tonbridge, Maidstone*
- Anoplodera sexguttata*, F. On flowers in woods; rare. *Darenth Wood*
- Leptura scutellata*, F. In old stumps of beech and hornbeam; very rare. *Cobham Park*
- *livida*, F. On flowers; rather common
- Strangalia quadrifasciata*, L. On flowers and in rotten wood; local. *Darenth Wood, Cobham Park, Chatham, Sittingbourne, Westerham*
- *revestita*, L. On flowers; very rare. *Darenth and Birch Woods* (S. Stevens)
- *armata*, Herbst. On flowers in woods; common and generally distributed
- *nigra*, L. On flowers in woods; local and not common. *Darenth Wood, Westerham, Tonbridge*
- *melanura*, L. On flowers; generally distributed and common
- Grammoptera tabacicolor*, De G. On flowers, especially hawthorn; in woods and hedges; not uncommon and generally distributed
- *analıs*, Panz. On flowers, and oak and elm trees; rare. *Chattenden* (Walker), *Darenth Wood* (Stephens), *Westerham* (Gorham), *Belvedere* (T. Wood)
- *ruficornis*, F. On flowers, in hedges and woods; very common

LAMIIDÆ

- Leiopus nebulosus*, L. In dead hedges, on alders and other trees; not uncommon
- Pogonochærus bidentatus*, Thoms. In dead hedges and under bark; not uncommon but local
- *dentatus*, Fourc. In hazel twigs, old hedges, old ivy, under bark, etc.; not uncommon
- Agapanthia lineatocollis*, Don. On thistles and *Heracleum*; rare. *Darenth Wood and West Wickham Wood*
- Saperda populnea*, L. On sallows, poplars, aspens, etc.; local. *Darenth Wood, Chattenden*
- Tetrops præusta*, L. In flowers and on old hedges; rather common and sometimes plentiful
- Phytæcia cylindrica*, L. On flowers of ox-eye daisy, *Umbelliferæ*, etc.; rare. *Chattenden, Wigmere Wood, Queendown Warren, Whitstable*

INSECTS

BRUCHIDÆ

- Bruchus cisti*, F. On *Helianthemum vulgare*; not uncommon, but somewhat local
- *canus*, Germ. On sainfoin (*Onobrychis sativa*); rare. *Halling Downs, Chattenden, Chatham, Gravesend, Darent Wood*
- *pisi*, L. In warehouses, in peas, etc.; not rare; introduced
- *rufimanus*, Boh. On beans, under bark in winter; common
- *affinis*, Fröhl. Imported in beans; rare. *Sydenham, Bearsted*
- *atomarius*, L. On flowers; local but widely distributed
- *rufipes*, Herbst. (*nubilus*, Boh.). On Leguminosæ; very rare. *Gravesend*, three specimens, June, 1869 (Power)
- *loti*, Payk. On *Lathyrus pratensis*, also on *Lotus corniculatus*; local but widely distributed
- *lentis*, Boh. On Leguminosæ; rare. *Gravesend and Birch Wood* (Power)
- *villosus*, F. (*ater*, Marsh.). On Leguminosæ, *Helianthemum*, *Spartium*, etc.; locally common and widely distributed

EUPODA

- Orsodacna lineola*, Panz. (*nigriceps*, Latr.). On hawthorn blossom, also on willows, etc.; rare. *Gravesend and Darent Wood*
- var. *humeralis*, Latr. On blossom and in decaying wood of hawthorn; very rare. *Darent Wood*
- Donacia crassipes*, F. On the white water-lily and other aquatic plants; rare. *Tonbridge, Deal*
- *dentata*, Hoppe. On aquatic plants; rare. *Sheerness*
- *versicolore*, Brahm. (*bidens*, Ol.). On aquatic plants; local. *Lee, Deal*
- *sparganii*, Ahr. On aquatic plants; rare. *Pegwell Bay*, in ditches (*Gorham*), *Sandwich*
- *limbata*, Panz. (*lemnæ*, F.). On aquatic plants; local, but widely distributed
- *bicolora*, Zach. (*sagittariæ*, F.). On aquatic plants; local. *Lee, Maidstone, Deal*
- *thalassina*, Germ. On *Scirpus*, *Carex*, etc.; rare. *Pegwell Bay, Deal*
- *impressa*, F. On *Carex*, etc.; rare. *Maidstone, Sandwich*
- *simplex*, F. (*linearis*, Hoppe). On rushes, etc.; common
- *vulgaris*, Zach. (*typhæ*, Ahr.). On *Typha*, *Sparganium*, etc.; local and

EUPODA (continued)

- as a rule rare. *Lewisham, Pegwell Bay, Deal, Sandwich*
- Donacia clavipes*, F. (*menyanthidis*, Gyll.). On aquatic plants in May and June; local. *Whitstable*
- *semicuprea*, Panz. (*simplex*, F.; syst. El.). As the preceding; local. *Dover, Sandwich*
- *cinerea*, Herbst (*hydrochæridis*, F.). On *Sparganium*, *Typha*, *Arundo*, etc., in May and June; rare. *Woolwich*
- *sericea*, L. On aquatic plants; common
- *discolor*, Panz. (*comari*, Suffr.). On aquatic plants; rare. *Lewisham, Deal*
- *braccata*, Scop. (*nigra*, F.). On aquatic plants in June; locally common. *Greenwich, Woolwich, Gravesend, Whitstable, Bearsted, Pegwell Bay, Deal*
- *affinis*, Kunze. On *Carex*, etc., in May and June; local and as a rule scarce. *Snodland* (locally common), *Greenwich, Maidstone, Birchington, Dover*
- Hæmonia curtisi*, Lac. On *Potamogeton pectinatus* and *Zostera marina*, in brackish water near the coast; locally common, but only found in a few localities. *Cuxton, Gravesend, Sheerness, Birchington*
- Zeugophora subspinosa*, F. On young aspens in woods; local, but not uncommon
- *flavicollis*, Marsh. In woods; very rare. *Ashford* (Hart.), *Bexley* (Stephens)
- Lema cyanella*, L. (*puncticollis*, Curt.). By sweeping in meadows; as a rule on thistles, especially *Cirsium arvense*; local. *Chattenden, Darent Wood, Maidstone*
- *lichenis*, Voet. (*cyanella*, Suffr. nec L.). Marshy places; very common
- *melanopa*, L. On herbage; common and generally distributed
- Crioceris liliæ*, Scop. (*merdigera*, F.). On the white lily, in gardens; very rare. *Deptford; Chattenden*, one specimen, 1895
- *asparagi*, L. On asparagus, in gardens; locally common

CAMPTOSOMATA

- Labidostomis tridentata*, L. On willows, birches, oaks, etc.; rare. *Darent Wood*
- Clythra quadripunctata*, L. On oaks, birches and hazels, also by sweeping;

A HISTORY OF KENT

CAMPTOSOMATA (continued)

often connected with *Formica rufa* ; local. *Lee, Wigmores Wood, Chattenden, Whitstable*, etc.

Cryptocephalus coryli, L. On young hazels in woods in June ; rare. *Darenth Wood, Cobham Park* ; taken in numbers in the latter locality in 1858, but not again found until 4 June, 1898, when Mr. Walker took a single specimen on hawthorn blossom

— *sexpunctatus*, L. On young hazels and birches in woods in June ; rare. *Darenth Wood, Cobham Park* ; like the preceding, taken in numbers in 1858 in the latter locality by Dr. Power and others, but has not occurred since

— *bipunctatus*, L., var. *lineola*, F. On young birch, hazel, oak, etc., in woods in June ; very local. *Queendown Warren*, abundant on stunted hazel ; *Cuxton, Wigmores Wood, Darenth Wood, Birch Wood, Folkestone*

— *aureolus*, Suffr. On flowers, especially *Hieracium* ; common in June

— *hypochæridis*, L. On flowers of *Hieracium* ; locally common. *Rochester district, Darenth Wood, Dover, Folkestone*

— *ochrostoma*, Har. (*nitidulus*, Gyll.) On young birch and hazels ; scarce. *Cobham Park, Darenth Wood*

— *punctiger*, Payk. As the preceding ; rare. *Darenth Wood, Lee*

— *parvulus*, Müll. (*fulcratus*, Germ.). On young birches, etc. ; scarce. *Darenth Wood, Birch Wood*

— *moræi*, L. By sweeping in chalky places ; very local. *Cobham Park, Wigmores Wood, Queendown Warren, Betteshanger Park, Tonbridge*

— *bilineatus*, L. By sweeping ; very local. *Lee, Whitstable, Queendown Warren, Birchington, Folkestone*

— *fulvus*, Goeze (*minutus*, F.). By sweeping ; local, but not uncommon

— *pusillus*, F. On young birches, etc., in woods ; local, but not uncommon in several localities

— *labiatus*, L. On young birches, hazels, oaks, etc. ; common

CYCLICA

Lamprosoma concolor, Sturm. By sweeping herbage, sometimes in moss ; local, but widely distributed

Timarcha tenebricosa, F. In grassy places, on heaths, on *Galium mollugo*, etc. ; very common

CYCLICA (continued)

Timarcha violaceonigra, De G. On *Galium verum*, on chalky hillsides and in meadows ; common

Chrysomela marginalis, Duft. On the flowers of *Linaria* ; local but not uncommon

— *marginata*, L. Sandy and grassy places ; rare. *Pegwell Bay*

— *banksi*, F. Chalky and sandy places ; local. *Dartford, Plumstead, Gravesend, Belvedere, Darenth and Birch Woods, Folkestone, Dover*

— *staphylæa*, L. By sweeping, also on grass ; common and generally distributed

— *polita*, L. As the preceding ; common everywhere

— *orichalcia*, Müll. On *Ballota nigra*, etc. ; local and not common in the *Rochester* district near *Cuxton* ; not uncommon in some places. *Plumstead, Darenth Wood, Belvedere, Abbey Wood*

— *hæmoptera*, L. On sandy coasts ; locally common. *Sheppey, Pegwell Bay, Deal, Sandwich*

— *varians*, Schall. By sweeping ; local and somewhat rare. *Wigmores Wood, Chattenden, Bredhurst, Chatbam, Darenth Wood*

— *goettingensis*, L. Sandy and chalky places ; not common. *Upnor, Darland Hill, Halling Downs, Chatbam, Beckenham, Darenth Wood, Sittingbourne, Chislehurst, Orpington, Belvedere, Ashford, Bromley, Folkestone* ; often occurs singly

— *graminis*, L. Very local. *Dover*

— *menthrasti*, Suffr. On *Tanacetum vulgare* and *Mentha aquatica* ; very local. *Westerham, Kent, Dover, Folkestone*

— *fastuosa*, Scop. On *Labiata*, etc., also by beating hawthorn ; local. *Darenth Wood, Deal, Dover*

— *didymata*, Scriba. In grassy places ; rare. *Cuxton Downs, Darenth Wood, Dover, Folkestone*

— *hyperici*, Forst. On *Hypericum* ; local, but not uncommon. *Cuxton, Cobham Park, West Wickham, Sheerness, Darenth Wood*

Melasoma populi, L. On young poplars and willows ; local. *Folkestone, Dover*

— *longicolle*, Suffr. On willows and aspens ; very local. *Blackheath, Darenth Wood, Chattenden, Dover*

Phytodecta rufipes, De G. On hazels,

INSECTS

CYCLICA (continued)

- aspens, willows, etc. ; local. *Darent Wood, West Wickham*
- Phytodecta viminalis*, L. On willows and willows ; local. *Darent and West Wickham Woods*
- *olivacea*, Forst. On the broom ; locally common and widely distributed
- *pallida*, L. On willow, hazel, mountain ash, etc. ; not common. *West Wickham, Folkestone*
- Gastroidea viridula*, De G. (raphani, Herbst). On the dock ; scarce. *Snodland* (J. J. W.) ; there appears to be no other record from *Kent*
- *polygoni*, L. On *Polygonum aviculare* and docks ; very common and sometimes in profusion
- Plagiodera versicolora*, Laich. On willows and birches ; very local. *Canterbury*
- Phædon tumidulus*, Germ. By sweeping ; common
- *armoraciæ*, L. (betulæ, Küst.). In damp places, by sweeping ; common
- *cochleariæ*, F. On *Cruciferae* ; rather common. *Snodland, Higham, Lee, Sheerness, Whitstable*
- *concinus*, Steph. Salt marshes, at roots of grass, in flood rubbish, etc. ; rare. Banks of *Medway, Gravesend*
- Phyllodecta vulgarissima*, L. On willows, willows, poplars, etc. ; common
- *cavifrons*, Thoms. On *Populus nigra* and *P. tremulæ* ; very local and scarce. *Darent Wood*
- *vitellinæ*, L. As the preceding ; very common
- Hydrothassa aucta*, F. Damp places ; not uncommon
- *marginella*, L. By sweeping, also at roots of grass ; common
- Prasocuris junci*, Brahm. On *Veronica beccabunga* (the brooklime) ; rather common
- *phellandrii*, L. On *Phellandrium aquaticum*, on banks of ponds and slow streams ; common
- Agelastica alni*, L. Very rare ; five specimens taken at *Deal* on the pathways in the streets on 6 May, 1900, by Mr. Jennings and Mr. Bedwell
- Luperus nigrofasciatus*, Goeze. On gorse, broom, ling, etc. ; rare. *Westerham*
- *rufipes*, Scop. On birch, willow, alder, etc. ; local. *Rochester district, Whitstable*
- *flavipes*, L. On birch, willow, alder, hazel, etc. ; local. *Lee, Walderslade* in the *Rochester* district, scarce

CYCLICA (continued)

- Lochmæa capreæ*, L. On willows and willows ; local. *Rochester* district
- *cratægi*, Forst. On flowers of white-thorn ; local and not common. *Wigmore Wood, Cobham Park, Chattenden*, etc.
- Galerucella viburni*, Payk. On *Viburnum opulus* (the guelder rose) and *V. lantana* ; local. *Lee, Darent Wood, Chattenden, Wigmore Wood*
- *nymphææ*, L. On aquatic plants, especially *Nymphæa* and *Nupar* ; local. *Snodland, Deal*
- *sagittariæ*, Gyll. On *Lysimachia*, *Hydrocharis*, *Hypericum*, rushes, etc. ; local. *Lee*
- *lincolæ*, F. On willows, alders and hazels ; local. *Snodland, Greenhithe*
- *calmariensis*, L. On *Lythrum salicaria*, etc. ; local. *Snodland, Maidstone, Dover*
- *tenella*, L. In osier beds on willows, also on alders and *Spiræa ulmaria* ; locally common. *Snodland* (abundant), *Lee*
- Adimonia tanacetii*, L. On *Tanacetum vulgare*, also in dry, sandy and grassy places ; apparently scarce. *Darent Wood, Chattenden*
- Sermyla halensis*, L. On flowers, especially species of *Galium* ; generally distributed and common
- Longitarsus pulex*, Schr. Chalky places, on *Teucrium scorodonia*, *Thymus serpyllum*, etc. ; locally common and widely distributed
- *anchusæ*, Payk. On *Echium vulgare*, *Cynoglossum*, *Anchusa*, etc. ; locally common. *Halling Downs, Darent Wood, Bearsted, Maidstone*
- *parvulus*, Payk. (ater, F.). On low plants and on hornbeam ; rare. *Chatham, Whitstable, Birchington, Deal*
- *absinthii*, Kuts. Salt marshes, on *Artemisia maritima* ; locally common. *Upnor, Chatham, Strood, Gravesend, Sheerness, Whitstable, Deal*
- *dorsalis*, F. In chalky places, on *Senecio jacobæa* and *S. vulgaris* ; local and not common. *Bexley, Darent Wood, Folkestone*
- *luridus*, Scop. On low plants ; common everywhere
- *brunneus*, Dufts. On low plants ; widely distributed
- *agilis*, Rye. On *Scrophularia aquatica* and *S. nodosa* ; very scarce. *Snodland, Staple, Bearsted*

A HISTORY OF KENT

CYCLICA (continued)

- Longitarsus suturellus, Duft. On Senecio jacobæa; very local. *Chattenden*, etc. var. fuscicollis, Steph. Locally common
- atricillus, L. On Medicago and other low plants; common
- patruelis, All. On Verbascum; rare. *Darenth Wood*
- melanocephalus, All. By sweeping; very common
- atriceps, Kuts. By sweeping; rare. *Cobham Great Wood, Darenth Wood*
- distinguendus, Rye. On Teucrium scorodonia and Scrophularia nodosa; very local and usually rare. *Rochester district, Wigmore Wood and Blue Bell Hill*
- nasturtii, F. On Echium vulgare; rare. *Lee, Darenth Wood, Birch Wood*
- piciceps, Steph. On Senecio jacobæa; locally common. *Darenth Wood, Chatham*
- membranaceus, Foudr. (teucii, All.). On Teucrium scorodonia (the wood-sage); local. *Wigmore Wood, Darenth Wood, Chatham, Gravesend, Dover*
- ballotæ, Marsh. On Ballota nigra and Marrubium vulgare; locally common. *Darenth Wood, Faversham, Chatham, Gravesend, Sheerness, Birchington*
- waterhousei, Kuts. By sweeping herbage; rare. *Chattenden, Chatham*
- exoletus, L. (femoralis, Marsh.). On Echium vulgare and Convolvulus sepium; locally common. *Halling and Cuxton Downs, Darenth Wood, Sheerness, Whitstable, Maidstone, Dover*
- pusillus, Gyll. On Thymus serpyllum; locally common
- tabidus, F. (and var. thapsi, Marsh.). On Verbascum thapsus; local but not uncommon where it occurs. *Cobham Park and neighbourhood, Chatham, Sevenoaks, Sheerness, Darenth Wood, Dover*
- jacobæa, Wat. On Senecio jacobæa (ragwort); very common
- ochroleucus, Marsh. By sweeping herbage; not uncommon
- gracilis, Kuts. On Senecio jacobæa; locally common
- lævis, Duft. On Chrysanthemum, Artemisia, etc.; locally common and widely distributed

CYCLICA (continued)

- Longitarsus pellucidus, Foudr. On Trifolium and Mentha; not common. *Darenth Wood, Sheerness, Whitstable, Maidstone*
- Haltica lythri, Aubé. Marshy places, on Epilobium and Lythrum salicaria; locally common. *Snodland, Higham, Maidstone*
- ampelophaga, Guér. On young hazels in woods; locally common. *Darenth Wood, Chattenden, Wigmore Wood, Birch Wood*
- oleracea, L. (pusilla, All. nec Duft.). Probably common
- pusilla, Duft. (helianthemii, All.). On Helianthemum and Epilobium; local. *Rochester district, Maidstone*
- Hermæophaga mercurialis, F. On Mercurialis perennis; common in woods and hedges
- Phyllotreta nodicornis, Marsh. On the wild mignonette, Reseda lutea; common on the chalk, though somewhat local
- nigripes, F. (lepidii, Koch). On Cruciferae; locally common
- consobrina, Curt. (melæna, Ill.). Very local and as a rule not common, but taken in great numbers by the Rev. T. Wood at *St. Peter's (Isle of Thanet)*, doing injury to cabbage, etc. *West Wickham, Maidstone*
- punctulata, Marsh. On Cruciferae; not common. *Margate*
- atra, Payk. On Cruciferae; common and generally distributed
- crucifera, Goeze (obscurella, Ill.). Locally common. *Lee, Dartford, Sheerness, Plumstead, Margate, Ramsgate, Deal*
- vittula, Redt. On Nasturtium amphibium and other Cruciferae; locally common
- undulata, Kuts. On Cruciferae, especially turnips; this is the 'turnip-fly,' and is only too common
- nemorum, L. As the preceding; very common; also spoken of as 'the turnip-fly'
- ochripes, Curt. On the hedge mustard (Erysimum alliaria) and other Cruciferae; common and widely distributed
- sinuata, Steph. On Raphanus raphanistrum and other Cruciferae; rare. *Blue Bell Hill (Chatham) and Sheerness*
- tetrastigma, Com. On Cardamine amara and nasturtium; locally common. *Snodland, Maidstone*

INSECTS

CYCLICA (*continued*)

- Phyllotreta exclamationis*, Thunb. (brassicæ, F.). Marshy places, on Cruciferae; very local. *Rochester* district
- Aphthona lutescens*, Gyll. Marshy places, on *Comarum palustre*, *Lythrum salicaria*, etc.; very local. *Snodland, Maidstone*
- *nonstriata*, Goeze. On *Iris pseudacorus*; locally common. *Snodland, Chatham, Northfleet*
- *venustula*, Kuts. On the wood-spurge (*Euphorbia amygdaloides*); locally common. *Rochester* district, *St. Peter's (Thanet), Chatham, Darent Wood, Birch Wood*
- *atro-cœrulea*, Steph. By sweeping in chalky places; locally common
- *viescens*, Foudr. By sweeping low plants in marshy places; local. *Maidstone, Deal, Folkestone*
- *atrata*, All. In chalky places, on *Teucrium*, *Helianthemum*, etc.; locally common. *Rochester* district, *Chatham, Sevenoaks, Margate, Dover*
- *herbigrada*, Curt. By sweeping in chalky places; locally common. *Rochester* district, *Chatham, Maidstone, Dover*
- Batophila rubi*, Payk. On *Rubus* and also on low plants; local. *Blue Bell Hill, near Chatham, Maidstone, Dover*
- *ærata*, Marsh. On *Rubus* and hawthorn; common and generally distributed
- Sphæroderma testaceum*, F. On thistles; common and generally distributed
- *cardui*, Gyll. On knapweed and thistles; common and widely distributed
- Apteropoda orbiculata*, Marsh. By sweeping, often found in moss; common and generally distributed
- *globosa*, Ill. In moss, etc.; rare. *Cobham Great Park and Walderslade (J. J. W.)*
- Mniophila muscorum*, Koch. In moss on chalky banks, stumps of trees, etc.; locally common. *Rochester* district, *Faversham, Birch Wood, Darent Wood, Westerham*
- Podgacrica fuscipes*, L. On mallows (*Malva sylvestris* and *M. moschata*); common and generally distributed
- *fuscicornis*, L. As the preceding
- Mantura rustica*, L. By sweeping, on *Rumex*, etc.; not very common, but widely distributed
- *obtusata*, Gyll. On *Spiræa ulmaria*, *Helianthemum*, etc.; local and as

CYCLICA (*continued*)

- a rule rare. *Snodland, Hollingbourne, Maidstone*
- Mantura matthewsi*, Curt. On *Helianthemum*, in chalky places; very local. *Rochester* district (not rare), *Chatham, Faversham, Maidstone, Eastry, Folkestone*
- Ochrosis salicariæ*, Payk. Marshy places, on *Lysimachia*, *Lythrum* and *Hypericum*; very local. *Cobham Great Wood*, on *Lysimachia nummularia*, in shady places, not rare (J. J. W.)
- Crepidodera transversa*, Marsh. On thistles, etc.; somewhat local but common
- *ferruginea*, Scop. On nettles, etc.; common
- *rufipes*, L. On *Malva*, *Orobis* and *Vicia*; common
- *ventralis*, Ill. By sweeping, in moss, etc.; local. *St. Mary Cray, Chatham, Faversham*
- *nitidula*, L. On willows and aspens; very rare. *Dover (C. G. Hall)*
- *helxines*, L. On willows, sallows, aspens and poplars; generally distributed and common
- *chloris*, Foudr. As the preceding; locally common. *Snodland, Sheerness, Maidstone, Dover*
- *aurata*, Marsh. As the preceding; very common
- Hippuriphila modeeri*, L. Marshy places, on *Equisetum arvense*; locally common. *Snodland, Sheerness, Faversham, Maidstone, Deal, Folkestone*
- Epitrix pubescens*, Koch. On *Solanum dulcamara*, marshy places; rare. *Iwade (J. J. W.), Sheppey*
- Chætocnema subcœrulea*, Kuts. By sweeping herbage, in moss, etc. *Pegwell Bay, Dover*
- *hortensis*, Fourc. By sweeping herbage; common and generally distributed
- Plectroscelis concinna*, Marsh. By sweeping; abundant everywhere
- Psylliodes attenuata*, Koch. On hops; generally distributed throughout the hop districts and occasionally very destructive
- *chrysocephala*, L. On Cruciferae, especially near the coast; common var. *anglica*, F. Not uncommon
- *napi*, Koch. On Cruciferae, especially watercress; common, but not so often met with as the preceding species

A HISTORY OF KENT

CYCLICA (*continued*)

- Psylliodes cuprea*, Koch. On Cruciferæ, poppies, etc.; not rare
 — *affinis*, Payk. On Solanaceæ; common and widely distributed
 — *marcida*, Ill. Sandy coasts; on *Crambe* and *Cakile*, etc.; rare. *Sheerness*
 — *dulcamaræ*, Koch. Chalky places; on *Solanum dulcamara*; local. *Rochester* district, *Chatham*, *Dartford*, *Darenth Wood*, *Westerham*, *Maidstone*
 — *chalconera*, Ill. On thistles, etc.; local. *Cobham Park*, *Chatham*, *Whitstable*, *Maidstone*, *Folkestone*
 — *picina*, Marsh. Damp places; on *Lythrum salicaria*, and also on *Cirsium*; not common. *Snodland*, *West Wickham*

CRYPTOSOMATA

- Cassida murræa*, L. On *Inula dysenterica* (fleabane) and *Mentha*; very local and scarce. *Greenwich*, *Plaistow*, *Dover*, *Sandwich*
 — *fastuosa*, Schall (*vittata*, F.). On *Senecio jacobæa*; very rare. *Chattenden*, *Greenwich*
 — *nebulosa*, L. On low plants; rare. *Darenth Wood*
 — *vibex*, F. On *Centaurea*, thistles, etc.; local. *Darenth Wood*, *Birch Wood*, *Belvedere*, *Cobham Park*, *Chattenden*, *Chatham*, *Faversham*, *Whitstable*, *Tonbridge*
 — *sanguinolenta*, F. On thistles, *Achillea millefolium* and other low plants; not common. *Blue Bell Hill* near *Rochester*, *Chatham*, *Deal*, *Dover*, *Folkestone*
 — *vittata*, Vill. (*oblonga*, Ill.). On *Salicornia* and other salt marsh plants; almost always found near the coast; local, but widely distributed
 — *nobilis*, L. On low plants in chalky and sandy places; local and rather scarce, but very widely distributed
 — *flaveola*, Thunb. (*obsoleta*, Ill.). On starwort and other low plants, also in moss, decaying seaweed, etc.; common
 — *equestris*, F. Marshy places on *Mentha aquatica*; not common. *Snodland*, *Maidstone*, *Dover*
 — *viridis*, F. On thistles; very common
 — *hemisphærica*, Herbst. On *Silene inflata* and other low plants, at roots of *Reseda*, etc.; rare and usually found singly. *Queendown Warren*, *Birch Wood*, *Lee*, *Deal*, *Folkestone*

TENEBRIONIDÆ

- Blaps mucronata*, Latr. In houses and cellars; generally distributed

TENEBRIONIDÆ (*continued*)

- Blaps similis*, Latr. In cellars and outbuildings, also out of doors; not common. *Strood*, *Kingsgate* on the seashore (*T. Wood*), *Dover*
Crypticus quisquilius, L. Sandy places on the coast; local. *Sheerness*, *Dover*, *Deal*, *Sandwich*
Heliopathes gibbus, F. Sandy places on the coast; locally common. *Deal*, *Dover*
Opatrum sabulosum, Gyll. Sandy places on the coast; locally common. *Whitstable*, *Deal*, *Dover*
Microzoum tibiale, Redt. Mostly on the coast, but not always; locally common. *Deal*, *Dover*
Phaleria cadaverina, F. On the coast, under seaweed, at roots of grass, etc.; local. *Margate*, *Dover*
Heledona agaricola, F. In dry white boleti on oak trees; very local. *Cobham Park* (sometimes very plentiful), *Chatham*, *West Wickham*
Scaphidema æneum, F. In old stumps, among damp dead sticks, etc.; local, but not uncommon in several localities
Alphitophagus quadripustulatus, Steph. In great numbers in a granary at *Strood*
Tenebrio molitor, L. In old flour in granaries; common
 — *obscurus*, F. In old flour, etc.; much rarer than the preceding. *Strood*, *Sheerness*, *Whitstable*, *Dover*
Alphitobius diaperinus, Panz. In flour, etc.; probably introduced; not common. *Queenborough* (J. J. W.)
 — *piceus*, Ol. As the preceding; rather common. *Rainham*, *Dover*, etc.
Gnathocerus cornutus, F. In flour, bread, etc., a cosmopolitan species; local. *Dover*, and probably widely distributed
Tribolium ferrugineum, F. A cosmopolitan species occurring in flour, also under bark of trees. *Rainham*, *Sheerness*, *Dover*, *St. Peter's (Isle of Thanet)* and probably common
Hypophlœus bicolor, Ol. Under bark of elms; very local. *Sydenham*, *Chatham*, *Charlton*, *Lee*, in old elms near *Chattenden*, also in burrows of *Scolytus destructor*
Latheticus oryzae, Wat. A cosmopolitan species. *Lee*
Helops cœruleus, L. In decaying willows, old posts, etc.; very local. *Chatham*, *New Brompton*, *Darenth Wood*, *Greenwich*, *Belvedere*, *Gravesend*, *Sheerness*, *Dover*

INSECTS

TENEBRIONIDÆ (continued)

- Helops pallidus*, Curt. Sandy places on the coast; not common. *Deal*
 — *striatus*, Fourc. In rotten wood, under loose bark, at 'sugar,' etc.; common everywhere

LAGRIIDÆ

- Lagria hirta*, L. In hedges, on flowers; very common

CISTELIDÆ

- Cistela luperus*, Herbst. On hazels and young oaks; local, but widely distributed
 — *ceramoides*, L. On oaks, *Umbelliferæ*, etc.; rare. *Sydenham*, *Belvedere*, *Lee*, *Darenth Wood*
 — *murina*, L. On flowers and shrubs; common
Eryx ater, F. In decaying willow, ash, etc.; nocturnal; rare. *Cobham Park*, *Chatham*
Mycetochares bipustulata, Ill. Under bark and in rotten wood; rare. *Lee*, *Darenth Wood*, *Dover*
Cteniopus sulphureus, L. A coast species, on flowers, rushes, etc.; locally common. *Deal*, *Dover*, *Folkestone*

MELANDRYIDÆ

- Tetratoma fungorum*, F. In fungoid growth on decaying trees, etc.; very local, and as a rule not common. *Erith*, *Sheerness*
 — *desmaresti*, Latr. In rotten wood with fungus growth; very rare. *Beckenham* (Power)
 — *ancora*, F. In moss on old stumps or fir, beech, etc.; very rare; two specimens, one at Darland Hill, the other in Cobham Park (J. J. W.)
Orchesia micans, Panz. In fungoid growth on old trees; rare. *Westerham*, *Darenth Wood*, *Cobham Park* (in hard boleti)
Clinocara undulata, Kr. In fungoid growth and under bark of beech and hornbeam, also on hawthorn blossom; rare. *Chatham*, *Cobham Park* (in plenty, J. J. W. and G. C. C.)
Hallomenus humeralis, Panz. In fungoid growth on old trees, rotten willow, etc.; very rare. *St. Mary's Island*, *Lee*, *Cobham Park*, *Chatham*
Conopalpus testaceus, Ol. In dead boughs of trees, also by sweeping; rare. *Darenth Wood* (R. W. Lloyd), *Shooters Hill*
Melandrya caraboides, L. In old willow stumps; local. *Darenth Wood*, *Lee*, *Charlton*, *Sevenoaks*, *Belvedere*, *Tonbridge*, *Dover*

MELANDRYIDÆ (continued)

- Anisoxya fuscula*. Ill. In dead twigs and by sweeping; very rare. *Lee*, *Darenth Wood*, *Cobham Park*
Abdera quadrifasciata, Steph. In fungoid growth on decayed hornbeam, also in short rotten stumps of boughs; very rare. *Cobham Park*, *Tonbridge*
 — *bifasciata*, Marsh. In dead boughs, also by beating hedges at the end of July; rare. *Cobham Park*, *Chattenden*, *Darenth Wood*, *Birch Wood*
Phlæotrya rufipes, Gyll. In decaying oak, etc.; rare. *Brasted*, near *Sevenoaks*, *Tunbridge Wells*
Hypulus quercinus, Quens. In decaying oak, etc., also by sweeping; very rare. *Darenth Wood*, *Plumstead Wood* (one specimen, S. Stevens)
Osphya bipunctata, F. On hawthorn blossom; very rare. *Chattenden Roughts* (about a dozen specimens taken by Mr. Champion, Mr. Walker and Mr. Chitty)

PYTHIDÆ

Salpingus castaneus, Panz. In decaying fir branches; local. *West Wickham*, *Darland Hill*, near *Chatham*
 — *ætatus*, Muls. (*ater*, Payk.). In dead twigs of fir, on walls and palings, etc.; rare. *Gravesend*, *Sheppey*, *Sittingbourne*, *West Wickham*
 — *foveolatus*, Ljungh. Very rare; one example taken by Mr. Walker under beech bark in *Cobham Park* on 21 August, 1895
Lissodema quadripustulata, Marsh. Among dead sticks and twigs; very local. *Rochester district*, *Darenth Wood*, *Lee*, *Sittingbourne*, *Tunbridge Wells*, *Kingsgate*
Rhinosimus ruficollis, L. Under bark and in dead twigs; local but not uncommon
 — *viridipennis*, Steph. As the preceding; not common but widely distributed
 — *planirostris*, F. Under bark, in moss, by sweeping, etc.; common and generally distributed

CEDEMERIDÆ

Cedemera nobilis, Scop. On flowers; generally distributed and common
 — *lurida*, Marsh. On flowers, chiefly in chalky places; local, but widely distributed
Oncomera femorata, F. On ivy bloom and at willows; nocturnal in its habits and comes to 'sugar'; local, but not rare. *Wigmore Wood*, *Chat-*

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CEDEMERIDÆ (continued)

ham, Darenth Wood, Tunbridge Wells, Westerham, Dover

Nacerdes melanura, Schmidt. On old posts and timber on the sea shore and at the mouths of large rivers; rather common locally and widely distributed

Ischnomera coerulea, L. In rotten wood of ivy, willow, etc., also on hawthorn blossom; local, but widely distributed

PYROCHROIDÆ

Pyrochroa coccinea, L. Under bark of decaying oak; very local, but sometimes found in numbers where it occurs. *Darenth and Birch Woods*

— *serraticornis*, Scop. On flowers and herbage; very common

MORDELLIDÆ

Mordella fasciata, F. On flowers of Umbelliferæ in woods; local, but sometimes very common. *Chattenden, Cuxton, Strood, Maidstone, Sittingbourne, Canterbury, Dover*

— *aculeata*, L. On flowers and herbage; very rare. *Cobham Park*, one specimen, June, 1897 (J. J. W.), *Westerham* (Gorham)

Mordellistena abdominalis, F. On flowers of hawthorn and Umbelliferæ, in and near woods; rare. *Chattenden Roughs, Chatham, Strood, Darenth Wood, Sevenoaks, Bearsted, Folkestone*

— *humeralis*, L. On Umbelliferæ; rare. *Cobham Park, Halling, Sevenoaks, Maidstone*

var. *lateralis*, Ol. Less uncommon than the type form. *Lee, Darenth Wood, Chatham, Sevenoaks, Bearsted*

— *brunnea*, F. On flowers of Umbelliferæ, by beating hawthorn hedges, etc.; local, and as a rule scarce. *Chattenden, Chatham, Eltham, Darenth Wood*

— *pumila*, Gyll. On flowers, especially on the chalk; locally common

— *brevicauda*, Boh. Chiefly on buttercups and Hieracium; very local. *Rochester district* (not rare), *Maidstone, Folkestone*

— *parvula*, Gyll., var. *inæqualis*, Muls. On Artemisia; local, but sometimes abundant. *Sheerness* (in numbers), *Deal, Folkestone*; the type form does not apparently occur in Britain

Anaspis frontalis, L. On hawthorn blossom and on herbage; common everywhere

MORDELLIDÆ (continued)

Anaspis garneysi, Fowler. On hawthorn blossom; rare. *Cobham Park*

— *pulicaria*, Costa (*forcipata*, Muls.). On flowers, etc.; locally common

— *rufilabris*, Gyll. On flowers and in dead twigs, etc.; local, perhaps overlooked. *Darenth Wood*

— *melanostoma*, Costa (*monilicornis*, Muls.). On flowers; very rare. *Darenth Wood*, one specimen (Power)

— *geoffroyi*, Müll. On flowers, especially hawthorn blossom; local, but not uncommon

— *ruficollis*, F. On hawthorn blossom, Umbelliferæ, etc.; very common

— *flava*, L., var. *thoracica*, L. (? *costæ*, Emery). On hawthorn blossom; not common. *Cobham Park, Darenth Wood*

— *subtestacea*, Steph. On hawthorn blossom, etc.; local. *Chattenden, Sevenoaks, Darenth Wood, West Wickham, Birch Wood*, etc.

— *maculata*, Fourc. On hawthorn blossom, etc.; common everywhere

ANTHICIDÆ

Notoxus monoceros, L. Sandy places, inland and on the coast; not uncommon and widely distributed

Anthicus humilis, Germ. Salt marshes on wet mud; not uncommon locally and widely distributed

— *salinus*, Crotch. Salt marshes; rare. *Gravesend, Strood*

— *floralis*, L. In hotbeds, haystack refuse, etc.; very common

var. *quisquilius*, Thoms. With the type form and equally common

— *instabilis*, Schmidt. Salt marshes; locally common

— *angustatus*, Curt. Salt marshes and on the beach under seaweed; rare. *Gravesend*

— *antherinus*, L. In moss, haystack and vegetable refuse, etc.; common and generally distributed

XYLOPHILIDÆ

Xylophilus populneus, F. In old trees, dead hedges, on flowers, etc.; rare. *Darenth Wood, Lee, Lewisham, Birch Wood, Sheerness*

— *oculatus*, Gyll. In decaying oak, white-thorn, etc.; rare. *Lee* (Douglas and Scott), *Birch Wood* (Power)

MELOIDÆ

Meloe proscarabæus, L. Found crawling on heaths, meadows, roads, etc., in early spring; common

INSECTS

MELOIDÆ (continued)

- Meloë violaceus, Marsh. As the preceding but much less common. *Cuxton, Queendown Warren, Blue Bell Hill, Strood, Dover*
- autumnalis, Ol. On grassy banks, pathways, etc., near the coast; very rare. *Dartford* (Stephens), *Ramsgate* (Newman)
- cicatricosus, Leach. As the preceding; extremely local, but sometimes in numbers. *Margate* and *St. Peter's, Thanet* (T. Wood), *Ramsgate* in great profusion (Champion), *Deal* (Syme), *Dover* (Hall)
- variegatus, Don. As the preceding; very rare. *Isle of Thanet*, between *Broadstairs* and *Ramsgate* (Stephens), *Ramsgate* (T. Wood), *Margate* (T. Wood), *Dover* (Hall)
- rugosus, Marsh. Grassy banks, etc., in the vicinity of nests of *Anthophora*; very rare. *Margate* (Stephens), *Broadstairs* (T. Wood)
- brevicollis, Panz. Sandy heaths; very rare. *Dartford* (Spiers), *Faversham* (Power)
- Sitaris muralis*, Först. Parasitic on *Anthophora*, and found in and near the nests; very rare. 'Kent' (Stephens)

PLATYRRHINIDÆ

- Brachytarsus fasciatus*, Först. In decaying hawthorn, elm, furze, etc., also by sweeping; local. *Lee, Darland Hill, Chattenden, Dover*
- varius, F. In decaying hawthorn, and also on firs and hazels; rare. *Darent Wood*
- Macrocephalus* (*Anthribus*) *albinus*, L. In decaying trees, especially oaks, willows and birches; rare. *Eltham, Gravesend* and *Darent Wood* (Stephens), *Ashford, Chattenden, Abbots Wood, Folkestone*
- Tropideres niveirostris*, F. In dead wood of birch, oak, etc., also in dead hedges and faggot stacks; very rare. *Darent Wood* (Champion), *West Wickham* (Power)
- Choragus sheppardi*, Kirby In dead twigs, also sitting at the roots of trees; rare. *Wigmore Wood, Chattenden, Chatham, Sevenoaks, St. Peter's, Isle of Thanet* (where I have found several specimens), *Deal*

CURCULIONIDÆ

- Apoderus coryli*, L. On the hazel; local. *Rochester district, Sheppey, Darent Wood*

CURCULIONIDÆ (continued)

- Attelabus curculionoides*, L. On young oaks; local but widely distributed and not uncommon
- Byctiscus betuleti*, F. In woods on young birch and hazel; very local. *Darent Wood, Westerham*
- *populi*, L. On young aspens; very local. *Darent and Lee Woods, Blenden*
- Rhynchites auratus*, Scop. On *Prunus spinosa* in hedges; very rare and doubtful; recorded by Marsham as 'taken in numbers at Crayford in Kent'
- *bacchus*, L. On the apple and vine and *Prunus spinosa*; very rare. *Crayford and Birch Wood* (Stephens); *Birch Wood*, taken in 1795 by Lady Maryon Wilson (Power)
- *cupreus*, L. On the flowers of the mountain ash and other trees; very rare. *Darent Wood* (Stephens)
- *æquatus*, L. On hawthorn blossom; common and generally distributed
- *æneovirens*, Marsh. In woods and hedges, on oaks, hazels, etc.; not uncommon
- *cæruleus*, De G. On various fruit trees, apple, plum and pear, etc., also on hawthorn blossom; local. *Chattenden Roughs, Darent Wood, Sheerness, Shooters Hill, Maidstone*
- *minutus*, Herbst. On young trees in woods, especially oaks, also on herbage; common and widely distributed
- *interpunctatus*, Steph. On young trees; not common. *Darent and Birch Woods*
- *pauillus*, Germ. On young oaks, hazels, etc., in woods; rare. *Darent Wood*
- *nanus*, Payk. On young birches in woods; local and not uncommon
- *uncinatus*, Thoms. On aspens, willows, oaks, hazels, etc.; local. *Chattenden Roughs*, scarce; *Darent Wood, Maidstone*
- *sericeus*, Herbst. On young birch and hazel in woods; very local. *Chattenden Roughs*, rare; *Darent Wood*
- *pubescens*, F. On young birch, hazel, oak, etc., in woods; not common. *Queendown Warren, Darent Wood, Westerham*
- Deporatus megacephalus*, Germ. On young birches; local. *Shorne, Darent Wood, Birch Wood, West Wickham*
- *betulæ*, L. On various young trees, but chiefly birches; common

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CURCULIONIDÆ (continued)

- Apion pomonæ, F. On *Vicia sepium*, *Lathyrus pratensis*, etc.; common
- craccæ, L. On *Vicia cracca*, etc.; local. *Darenth Wood*, *Chattenden Roughts*, *Dover*, *Hythe*
- subulatum, Kirby. On *Vicia*, *Lathyrus* and *Lotus*; local. *Chattenden Roughts*, *Chatham*, *Tonbridge*, *Maidstone*, *Herne Bay*, *Dover*
- ulicis, Först. On *Ulex europæus* (common furze) and *U. nanus*; very common everywhere
- genistæ, Kirby. On *Genista*; rare. *Bearsted* near *Maidstone*
- fuscirostre, F. On *Genista* and *Sarothamnus*; very local. *Chattenden*, *Whitstable*, *Plumstead*, *Birch Wood*, *Charlton*
- malvæ, F. On species of *Malva*; common and generally distributed
- urticarium, Herbst. On *Urtica dioica* (the common stinging nettle); locally common. *Darenth Wood*, *Gravesend*, *Dartford*, *Sheerness*, *Belvedere*, *Sittingbourne*, *Deal*
- miniatum, Germ. On the dock (*Rumex obtusifolius*, etc.); common and generally distributed
- cruentatum, Walt. On the sorrel (*Rumex acetosella*), and also on sallows; not common. *Sydenham*, *Cobham Park*, *Chatham*, *Birch Wood*, *Deal*
- hæmatodes, Kirby. Sandy places, chiefly on the wood sage (*Teucrium scorodonia*); local but not uncommon. *Rochester* district, *Deal*
- rubens, Steph. Sandy places on sorrel and wood sage; not common. *Cobham Park*, *West Wickham*
- pallipes, Kirby. On *Mercurialis perennis* and *Allium*, chiefly in chalky districts; very local. *Birch Wood*, *Sevenoaks*, *St. Mary Cray*, *Birchington*, *Maidstone*
- semivittatum, Gyll. On *Mercurialis annua*; very rare; found many years ago by Mr. Walton in the Tivoli gardens, *Margate*; there is no other British record
- rufirostre, F. On mallows; common everywhere
- vicinæ, Payk. On *Vicia cracca*; locally common. *Chattenden*, *Chatham*, *Birch Wood*, *Deal*
- difforme, Germ. Marshy places, on *Polygonum hydropiper*, etc.; not uncommon locally and widely distributed

CURCULIONIDÆ (continued)

- Apion dissimile, Germ. On *Trifolium arvense*; very local. *Sevenoaks*, *Birch Wood*, *Deal*, *Sandwich*
- varipes, Germ. On the red clover; very local. *Birch Wood*, *Dartford*, *Maidstone*, *Birchington*, *Pegwell Bay*, *Dover*
- lævicolle, Kirby. Sandy and chalky places, in stack refuse, etc.; local. *Rainham Marshes*, *Darenth*, *Gravesend*, *Sheerness*, *Dartford*, *Deal*, *Dover*
- schonherri, Boh. Probably on *Trifolium*; very local. *Sheerness* (G.C.C. and J. J. W.)
- apicans, Herbst. On the red clover (*Trifolium pratense*) and occasionally on trees; generally distributed and common
- bohemani, Thoms. On the rest-harrow (*Ononis*); common and generally distributed, but found chiefly on the coast
- trifolii, L. On the red clover; generally distributed and common
- dichroum, Bedel. On the white clover (*Trifolium repens*), *Spiræa*, etc.; generally distributed and common
- nigritarse, Kirby. On various species of clover; common
- confluens, Kirby. On *Matricaria chamomilla* and *Chrysanthemum leucanthemum* (ox-eye daisy); locally common and widely distributed
- stolidum, Germ. On the ox-eye daisy; not common. *Chattenden*, *Halling Downs*, *Birch Wood*, *Sheerness*, *Birchington*, *Folkestone*, *Deal*
- sorbi, F. On *Matricaria*, *Anthemis*, the wild cherry, the blackthorn, etc.; female very rare; male extremely rare. *Tunbridge Wells* (male)
- hookeri, Kirby. On *Matricaria chamomilla*, *Hieracium*, red clover, etc.; not uncommon and widely distributed
- æneum, F. On various species of mallow; very common
- radiolus, F. With the preceding and equally common
- onopordi, Kirby. On *Onopordon acanthium* and other thistles; very common
- carduorum, Kirby. On thistles; generally distributed and common
- lævigatum, Kirby. By sweeping low plants in August and September; extremely rare; a few specimens have been captured in *Birch Wood* many years ago by Mr. S. Stevens

INSECTS

CURCULIONIDÆ (continued)

- and others; it is found on *Gnaphalium* (Filago) gallicum, the larva living in a gall on the terminal bud of the plant
- Apion flavimanum*, Gyll. Chalky districts on *Teucrium scorodonia*; very local. *Rochester* district, not rare; *Gravesend*, *Faversham*, *Bearsted*
- *annulipes*, Wenck. Chalky hillsides; very rare. *Chattenden*, one specimen (*Champion*)
- *vicinum*, Kirby. On *Thymus serpyllum*, *Mentha aquatica*, etc.; rare. *Pegwell Bay* (T. Wood)
- *atomarium*, Kirby. Chalky places on *Thymus serpyllum*; very local. *Cobham Park*, *Cuxton Downs*, *Darland Hill*, *Birch Wood*, *Dover*
- *minimum*, Herbst. On various species of *Salix*; very local, and as a rule rare. *Maidstone*, *Dover*
- *virens*, Herbst. On species of clover; common and generally distributed
- *punctigerum*, Payk. On *Vicia sepium* and *V. cracca*; local, but widely distributed
- *pisi*, F. On clovers and vetches; one of our most abundant species
- *æthiops*, Herbst. On *Vicia sepium* and *V. sativa*; rather common
- *ebeninum*, Kirby. On *Lotus corniculatus*, *L. major*, etc.; local, but not uncommon
- *filirostre*, Kirby. Chalky and sandy places; scarce. *Rochester* district, *Dartford*, *Birch Wood*, *Charlton*, *Sheerness*, *Whitstable*, *Maidstone*
- *striatum*, Kirby. On *Ulex* and *Sarothamnus*; common and generally distributed
- *immune*, Kirby. On *Sarothamnus*; local, but not uncommon where found. *Charlton*, *Chatham*, *Birch Wood*, *Bearsted*, *Dover*
- *ononis*, Kirby. On *Ononis spinosa*; locally common. *Whitstable*, *Dover*, *Folkestone*
- *spencei*, Kirby. On *Vicia cracca*; rare. *Margate*
- *ervi*, Kirby. On *Lathyrus pratensis*, etc. Common
- *vorax*, Herbst. On *Vicia cracca* and other Leguminosæ; rather common and widely distributed
- *gyllenhali*, Kirby. On *Vicia cracca*; also on trees; rare. *Whitstable*
- *unicolor*, Kirby. On *Vicia cracca* and other Leguminosæ; rare. *Chattenden*, *Chatham*, etc.

CURCULIONIDÆ (continued)

- Apion meliloti*, Kirby. On *Melilotus officinalis*; locally abundant. *Charlton*, *Bearsted*, *Frindsbury* chalk pits, *Snodland*
- *scutellare*, Kirby. On furze (*Ulex europæus* and *U. nanus*); very local. *Charlton*
- *livescerum*, Gyll. On the sainfoin (*Onobrychis sativa*); local. *Rochester* district, *Whitstable*, *Darenth Wood*, *Dartford*, *Birchington*
- *waltoni*, Steph. Chalky places, on *Thymus serpyllum*, etc.; very local. *Rochester* district, *Sevenoaks*, *Dartford*, *Faversham*
- *loti*, Kirby. On *Lotus corniculatus*; common
- *seniculum*, Kirby. On *Trifolium pratense* and other low plants; rather common and widely distributed
- *tenuis*, Kirby. On *Melilotus* and *Medicago*; not so common as the preceding, but generally distributed
- *simile*, Kirby. On birch; local. *Birch Wood*, *Gravesend*, *Whitstable*
- *pubescens*, Kirby. On willows and by sweeping; very local. *Rochester* district, rare; *Birch Wood*, *Sheerness*, *Kingsgate*, *Deal*
- *curtisi*, Walt. On the coast, by sweeping; very local. *Deal*
- *limonii*, Kirby. Salt marshes on the decaying leaves and at old roots of *Statice limonium* (the sea lavender); very local. *Gravesend*, *Strood*, *Sheerness*, *Sheppey*, *Whitstable*, *Dover*, *Folkestone*, *Hythe*
- *sedi*, Germ. Sandy places on species of *Sedum*; very local, and as a rule rare. *Deal*
- *marchicum*, Herbst. On dock, wood-sage, etc.; local. *Bromley*, *Deal*, *Dover*
- *affine*, Kirby. Under *Sarothamnus scoparius* and by sweeping; not common. *Lee*, *Bearsted*
- *violaceum*, Kirby. On species of dock; very common
- *hydrolpathi*, Kirby. On the great water dock (*Rumex hydrolapathum*), and also on *R. obtusifolius*; local. *Snodland*, *St. Mary Cray*, *Chatham*, *Lee*, *Sheerness*, *Dartford*
- *humile*, Germ. On the dock and on herbage generally; very common everywhere
- Otiorrhynchus tenebricosus*, Herbst. By beating hedges, in moss, etc.; not uncommon on the chalk

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CURCULIONIDÆ (continued)

- Otiorrhynchus fuscipes*, Walton. As the preceding; not common. *Chatham, Sheerness, Folkestone*
- *atroapterus*, De G. On the coast, at roots of grass, etc.; locally common. *Deal, Dover*
- *rancus*, F. By sweeping herbage, in chalky or sandy places; rare. *Darland Hill, Cobham Park, Greenhithe, Bearsted*
- *scabrosus*, Marsh. Under stones, in moss, at roots of plants, etc.; also on hedges; common
- *ligneus*, Ol. As the preceding but less common, though widely distributed
- *picipes*, F. By beating young trees and hedges; only too common; sometimes does great damage to raspberry canes
- *sulcatus*, F. At roots of plants, in moss, etc.; very common; often very injurious to vines, strawberries, ferns, etc.
- *rugifrons*, Gyll. At roots of grass, under decaying seaweed, etc.; mostly near the coast; local. *Dover*
- *ovatus*, L. In moss, on hedges, etc.; generally common
- *muscorum*, Bris. In moss, by sweeping, etc.; not uncommon. *Dartford, West Wickham, St. Mary Cray*
- Trachypylæus aristatus*, Gyll. In moss and at roots of *Lotus corniculatus*, in sandy or chalky places; not common. *Faversham, Birch Wood*
- *squamulatus*, Ol. As the preceding; not common. *Darland Hill, Chatham, Faversham, Hythe*
- *scaber*, L. In moss and by sweeping; common
- *scabriculus*, L. In sandy and chalky places, in moss, and at roots of herbage; common
- *spinimanus*, Germ. On chalky hillsides, at the roots of *Helianthemum vulgare*; very local and usually very rare. *Rochester and Chatham district*; taken in large numbers at *Darland Hill, Queendown Warren*, etc., by Mr. Champion and Mr. Walker. *Sheppey, Dover*
- *alternans*, Gyll. As the preceding; very local. *Darland Hill, Queendown Warren, Halling, Ashford, Eastry, Margate, Dover* (common, J. J. W.), *Folkestone*
- Cænopsis fissirostris*, Walt. In thick wet moss in May in sandy places; rare. *Chislehurst* (Marsh.), *Plumstead* (Smith)

CURCULIONIDÆ (continued)

- Cænopsis waltoni*, Boh. Sandy and chalky places, in moss, etc.; very local. *Chatham, Dartford, Plumstead* (abundant 30 July, 1864, Power), *Hythe*
- Strophosomus coryli*, F. On young hazel, oaks, etc.; common everywhere
- *capitatus*, De G. As the preceding; common
- *retusus*, Marsh. On heath, gorse, young oaks, etc.; local. *Darenth Wood, Brasted*
- *faber*, Herbst. At roots of grass and low plants, etc.; local, but widely distributed
- *lateralis*, Payk. On heath and ling; very common
- Exomias araneiformis*, Schr. In moss, etc.; common everywhere
- *pellucidus*, Boh. Sandy places; very local, and as a rule rare, but sometimes in profusion. *Eastry near Sandwich* (Gorham), *St. Peter's, Isle of Thanet* (T. Wood)
- Brachysomus echinatus*, Bonsd. In moss and faggots and by sweeping; locally common. *Darland Hill, Queendown Warren, Snodhurst, Cobham Park, Darenth Wood, Birch Wood, West Wickham*
- *hirtus*, Boh. Chalky hillsides in moss; very rare. *Cobham Park, Blue Bell Hill, Walderslade* (J. J. W.), *Tonbridge* (Wollaston)
- Sciaphilus muricatus*, F. In woods and hedges, often in moss; common
- Tropiphorus carinatus*, Mull. In moss, under stones and by sweeping; rare. *Wigmore Wood, Chatham, Faversham, Folkestone, Hythe*
- Liophlæus nubilus*, F. On hedges and herbage; common
- Metallites marginatus*, Steph. On broom and juniper; very local. *Wigmore Wood, Chatham, St. Mary Cray, Birch Wood, Maidstone*
- Polydrusus micans*, F. On young birches, wild cherry, hazels, willows, oaks, etc.; local. *Cuxton, Wigmore Wood, Darenth Wood, Shooters Hill, Westerham, Bearsted, Swanscombe Wood* near *Gravesend*
- *tereticollis*, De G. (*undatus*, F.). On young trees in woods and hedges; common and generally distributed
- *pterygomalis*, Boh. On young oaks and hazels; somewhat local but common. *Chatham, Darenth Wood*, etc.
- *flavipes*, De G. On young trees in

INSECTS

CURCULIONIDÆ (continued)

- woods; rare. *Lee, Bearsted near Maidstone, Hythe*
- Polydrusus cervinus*, L. On young trees, especially oaks, birch and fir; common and generally distributed
- *chrysomela*, Ol. On *Artemisia maritima*, on the coast; rare. Near *Strood, Gravesend, Sheerness*
- *confluens*, Steph. On broom and furze; very local, but not uncommon where it occurs. *Charlton, Plumstead, Gravesend, Bearsted*
- Phyllobius oblongus*, L. On elms and apple trees, also by beating hedges; common and generally distributed
- *calcaratus*, F. On alders, also on young trees in woods, etc.; local. *Lee, Darent Wood*
- *urticæ*, De G. On nettles; very common and generally distributed
- *pyri*, L. On hawthorn, nettles, young trees in woods, etc.; common and generally distributed
- *argentatus*, L. On young birches, oaks, etc.; very common
- *maculicornis*, Germ. On young oaks, hazels, etc.; local, but not uncommon and widely distributed
- *pomonæ*, Ol. On young trees; local but not uncommon
- *viridiæris*, Laich. (*uniformis*, Marsh.). Very abundant, and generally distributed
- Tanymecus palliatus*, F. On burdocks, thistles, nettles, etc.; local. *Darent Wood, Chattenen Roughs* (rather scarce), *Chatham, Sheerness*
- Philopodon geminatus*, F. Sandy places on the coast. *Deal*, abundant, and probably common elsewhere
- Atactogenus exaratus*, Marsh. On young trees, also by sweeping; local, but very widely distributed
- Barynotus obscurus*, F. At roots of grass, in moss, etc.; rather common
- *elevatus*, Marsh. (*mærens auct nec F.*). As the preceding; local, and as a rule scarce. *St. Mary Cray, Chislehurst, banks of Medway* (in flood rubbish), *Folkestone*
- Alophus triguttatus*, F. Sandy and chalky places, under stones, in moss, etc.; not uncommon as a rule. *Rochester district* (rare), *Chatham, Ramsgate, Dover, Folkestone*
- Sitones griseus*, F. Sandy places, at roots of *Genistæ*, grass, etc.; very local. *Deal*
- *cambricus*, Steph. Marshy places, at

CURCULIONIDÆ (continued)

- roots of grass, in moss, and by sweeping; rare. *Chattenen Roughs, Lee, Charlton, Plumstead, Hythe*
- Sitones regensteiniensis*, Herbst. On broom and furze; abundant everywhere
- *crinitus*, Herbst. On broom, clover, peas, etc., often in sandpits; common and generally distributed
- *tibialis*, Herbst. On broom, furze, clover, heath, etc.; very common
- *brevicollis*, Schön. *Chattenen Roughs*, etc.; perhaps a variety of the preceding
- *hispidulus*, F. On clover; very common
- *humeralis*, Steph. On clover, vetches, etc.; common
- *meliloti*, Walt. On *Melilotus officinalis*; very local. *Frindsbury chalk pits* (common), *Chatham, Plumstead*
- *flavescens*, Marsh. By sweeping clover, in moss, etc.; rather common and widely distributed
- *puncticollis*, Steph. On clover, vetches, etc.; very common
- *suturalis*, Steph. On vetches and other low plants; rather local. *Chattenen, Herne Bay, Whitstable*
- *ononidis*, Sharp. On *Ononis spinosa*; very local. *Herne Bay, Whitstable*
- *lineatus*, L. On clover, vetches, peas, etc.; only too common; often very injurious to peas
- *sulcifrons*, Thunb. By sweeping clover, lucerne, vetch, etc.; rather common and widely distributed
- Gronops lunatus*, L. At roots of low plants, nearly always by the sea; local. *Blackheath, Deal, Dover*
- Limobius dissimilis*, Herbst. On *Geranium pratense*, also at roots of *Geranium sanguineum*; rare. *Darland Hill, Holly Hill, Boxley Warren, Chatham, Sandwich sandhills*
- *mixtus*, Boh. Sandy places; on *Erodium cicutarium*; very local. *Deal sandhills* (common), *Dover*
- Hypera punctata*, F. On species of *Trifolium*, in moss, etc.; very common everywhere
- *fasiculata*, Herbst. Sandy places near the sea, under *Erodium cicutarium*; extremely local. *Deal sandhills, Sandwich*
- *rumicis*, L. Marshy places, on docks; common
- *pollux*, F. On various *Umbelliferæ* (*Sium*, etc.); local, but not un-

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CURCULIONIDÆ (continued)

- common where it occurs. *Higham* (scarce), *Northfleet*, *Pegwell Bay*, *Sandwich*, *Dover*, *Folkestone*
- Hypera alternans*, Steph. (julini, Sahlb). Marshy places, at roots of plants, etc.; not common. *Lee*, *Eastry*, *Sandwich*, *Pegwell Bay*
- *polygoni*, L. On various plants, especially Leguminosæ, Polygonum, Lychnis and Silene inflata; widely distributed, but commoner in some localities than in others
- *tigrina*, Boh. Chalky places, on the heads of *Daucus carota* (the wild carrot); very rare. *Dover*, *Folkestone* (S. Stevens)
- *elongata*, Payk. Very rare and perhaps not indigenous. *Birch Wood* (Power and Brewer). Dr. Power's specimen appears doubtful
- *suspiciosa*, Herbst. On various Leguminosæ; local, but not uncommon, and widely distributed
- *variabilis*, Herbst. On various Leguminosæ, Trifolium, Medicago, etc.; very common and generally distributed
- *murina*, F. By sweeping, also at roots of grass; very local. *Sydenham*, *Rochester* district, *Whitstable*, *Gravesend*, *Dartford*, *Maidstone*
- *plantaginis*, De G. Chalky and sandy places, in moss and on low plants, especially Plantago; not uncommon and widely distributed
- *trilineata*, Marsh. On Leguminosæ, also in moss and hay stack refuse; rather common
- *nigrirostris*, F. On various species of clover; common everywhere
- Rhinocyllus latirostris*, Latr. On species of thistles; local and usually rare. *Canterbury*, *Faversham* (where Mr. Walker found it in abundance)
- Cleonus sulcirostris*, L. On species of thistles; chiefly but not entirely on the coast; common
- Lixus algirus*, L. (angustatus, F.). On thistles and low growing Malvaceæ; very rare. *Sydenham* (Stephens)
- *bicolor*, Ol. On the coast, under and at the roots of *Erodium cicutarium*; very local and usually rare. *Deal* sandhills, *Isle of Thanet*, *Sandwich* sandhills (Gorham)
- Larinus carlinæ*, Ol. On thistles; rare. *Dover*, *Sandgate*
- Liosoma ovatum*, Clairv. In moss and at roots of grass; common

CURCULIONIDÆ (continued)

- Liosoma ovatum* var. *collaris*, Rye. Occurs with the type form, but much more rarely. *Lee*, *Chattenden Roughs*
- *oblongulum*, Boh. Chalky and sandy places, in moss and by sweeping; rare. *Chattenden Roughs*, *Wigmore Wood*, *Cobham Great Wood*, *Faversham*
- *pyrenæum*, Bris. (troglodytes, Rye.). Chalky banks, in damp moss in spring; very rare. *Blue Bell Hill*, *Chatham* and *Faversham* (J. J. W. and G. C. C.)
- Liparus coronatus*, Goeze. On Umbelliferae (*Heracleum chærophyllum*, etc.), also under stones, on grass stems and crawling on roads; rather common. *Strood*, *Darland Hill*, *Lee*, *Darent Wood*, *Maidstone*, *Folkestone*, etc.
- *germanus*, L. Not common. *Maidstone*, *Staple*, *Sandgate*, *Dover*, *Ashford*, *Hythe*, *Folkestone*
- Curculio abietis*, L. On pines and firs; locally common and widely distributed
- Plinthus caliginosus*, F. Under stones and in moss, also under faggots in woods; local, but not uncommon in some places. *Rochester* district, scarce; *Chatham*, *Charlton*, *Faversham*, *Dartford*, *Maidstone*, *Westerham*, *Kingsgate*, *Sandgate*, *Dover*, *Folkestone*
- Orchestes quercus*, L. On oaks; common and generally distributed
- *scutellaris*, Gyll. On alder and wild cherry; rare. *Darent Wood* (Stephens), *Bearsted*, *Deal*
- *alni*, L. On elms, etc.; common everywhere
- var. *ferrugineus*, Marsh. With the preceding, but not so common
- *ilicis*, F. On oak, birch, holly, etc.; somewhat local, but not uncommon. *Lee*, *Darent Wood*
- var. *nigripes*, Fowler. Rare. *Birch Wood*, *Plumstead* and *Folkestone* (Power)
- *avellanæ*, Don. On hazels and oaks; not uncommon and widely distributed
- *fagi*, L. On the beech; common everywhere
- *pratensis*, Germ. By sweeping thyme and other low plants; on the chalk; very local, and as a rule rare. *Chattenden*, *Halling Downs*, *Maidstone*, *Folkestone*

INSECTS

CURCULIONIDÆ (continued)

- Orchestes rusci*, Herbst. In woods, on hazel, birch, etc.; not uncommon
- *stigma*, Germ. On willows, willows, alders, etc.; not uncommon
- *salicis*, L. On willows and willows; local, but not uncommon. *Chatham, Sheerness, Darent Wood*
- *saliceti*, Payk. On willows and willows; very local, and not common as a rule. *Chattenden* (not rare), *Snodland*
- Rhamphus flavicornis*, Clairv. On willows, etc.; locally common and widely distributed
- Orthocætes setiger*, Beck. Sandy and chalky places, in moss and at roots of low plants, especially ragwort and sorrel; local, but not uncommon in many places. *Blue Bell and Darland Hills* (scarce), *Chatham, Sheerness, Faversham, Kingsgate, Dover, Deal*
- Pseudostyphlus pilumnus*, Gyll. On *Matricaria chamomilla*; very local. *Darland Hill* (rare), *Chatham, Lee, Sheerness*
- Procas armillatus*, F. Very rare; a single specimen was taken by Mr. J. J. Walker in a dry tuft of grass at *Darland Hill* on 11 March, 1897
- Grypidius equiseti*, F. On *Equisetum*; not common. *Chattenden, Hytbe*
- Eriirrhinus scirpi*, F. Marshy places, on *Scirpus*; not common. *Gravesend*
- *bimaculatus*, F. Near river banks, on willows, etc.; not common. Banks of *Medway, Gravesend*
- *acidulus*, L. Marshy places, in moss, flood refuse, etc.; very common
- Thryogenes festucæ*, Herbst. Marshy places, on *Scirpus* and *Carex*; not common. *Gravesend, Whitstable*
- *neris*, Payk. Marshy places, in tufts of grass, on reeds, etc.; locally common. *Rainham Marshes, Sheerness, Whitstable, Gravesend, Faversham, Birchington, Sandwich, Deal*
- *scirrhosus*, Gyll. Marshy places, on water plants; not common. *Sheerness, Eltham, Pegwell Bay*
- Dorytomus vorax*, F. On poplars and aspens, often in chinks of the bark; very local. *Dover*
- *tremulæ*. On young aspens (*Populus tremula*), also on *P. alba*, end of June; rare. *Birch Wood, Swanscombe Wood* (near *Gravesend*), *West Wickham*
- *tortrix*, L. On aspens and willows; very local. *Darent Wood, Swans-*

CURCULIONIDÆ (continued)

- combe Wood, St. Peter's (Isle of Thanet)*
- Dorytomus maculatus*, Marsh. On willows and willows; common and generally distributed
- var. *costirostris*, Gyll. On young aspens and willows; rare. *Darent Wood and Swanscombe Woods, Chattenden*
- var. *silbermanni*, Wenck. On willows and aspens; very local. *Sheerness, Darent Wood*
- *melanophthalmus*, Payk., var. *agnathus*, Boh. On willows; very local. *Sydenham, Darent Wood*
- *pectoralis*, Gyll. On willows; local. *Chattenden Roughs* (rather scarce), *Darent Wood, Sydenham, Whitstable, Sevenoaks, Dover*
- Smicronyx reichei*, Gyll. On dodder (*Cuscuta europæa* and *C. epithymum*); rare. *Holly Hill and Cuxton Downs, Birch Wood*
- var. *championis*, Fowler. Rare; *Folkestone* (E. A. Waterhouse), between *Folkestone* and *Dover* (*Champion*)
- *jungermanniæ*, Reich. On *Cuscuta epithymum*. Rare, but sometimes locally common. *Halling Downs near Rochester*
- Tanyssphyrus lemnæ*, F. In ponds and ditches, on *Lemna*; common and widely distributed
- Bagous alismatis*, Marsh. In ditches and stagnant ponds, on *Alisma plantago* (the water-plantain); local, but not uncommon. *Snodland, Lee, Rams-gate, Deal, Dover*
- *cylindrus*, Payk. In ditches, on aquatic plants; rare. *Lee, Gravesend, Sheppey, Whitstable*
- *binodulus*, Herbst. In ditches; very rare. *Sandwich* (Sharp and Saunders)
- *nodulosus*, Gyll. In ditches; very rare. *Pegwell Bay*
- *argillaceus*, Gyll. (incertus, *Brit. Coll.*). Brackish ditches; very local and usually rare. *Gravesend, Sheerness*
- *limosus*, Gyll. In brackish ditches; very local and usually rare. *St. Mary's Island and Cuxton, Sheerness, Gravesend* (in numbers, 19 April, 1867, Power)
- *tempestivus*, Herbst. In ditches; very local. *Sheerness, Gravesend, Whitstable, Maidstone*
- *subcarinatus*, *Brit. Coll.* In ditches; rare. *Sheerness*

A HISTORY OF KENT

CURCULIONIDÆ (continued)

Bagous claudicans, Boh. (frit, *Brit. Coll.*).
Rare, but more common than the preceding, and sometimes found in numbers. *Sheerness*

Anoplus plantaris, Naesz. On young trees in woods; common

Elleschus bipunctatus, L. On sallows and poplars; very local. *Darenth Wood*

Tychius venustus, F. On broom; extremely local. *Darenth Wood, Birch Wood, Sittingbourne*

— *squamulatus*, Gyll. On the chalk, by sweeping; the larva feeds in pods of *Lotus corniculatus*; local. *Darland Hill, Snodland, Charlton*

— *schneideri*, Herbst. On the chalk, on *Anthyllis vulneraria*; very local. *Rochester district, Charlton, Kingsgate Folkestone*

— *meliloti*, Steph. On *Melilotus officinalis*. Locally common. *Rochester district, Charlton, Maidstone, Dover*

— *lineatulus*, Bris. On the chalk, on *Anthyllis vulneraria*; local and not common. *Blue Bell Hill, Chatham, Darenth Wood, Herne Bay*

— *juncceus*, Reich. By sweeping vetch and clover, chiefly on the chalk; local. *Rochester district, Charlton, West Wickham*

— *tomentosus*, Herbst. Chalky and sandy places, on vetches, etc.; local. *Rochester district, Tonbridge*

— *tibialis*, Boh. Sandy places, by sweeping; rare. *Deal*

— *pygmæus*, Bris. On broom and other plants; not common. *Rochester district, Gravesend, Hawkburst, Maidstone, Deal*

Microtrogus picirostris, F. By sweeping, in haystack refuse, perhaps attached more particularly to the red clover; common and widely distributed

Sibinia potentillæ, Germ. Sandy places; on *Spergula arvensis*, etc.; very local. *Bekvedere, Birch Wood*

— *arenariæ*, Steph. Sandy places near the coast; on *Arenaria maritima*; locally common. *Sheerness*

— *primita*, Herbst. On *Spergula arvensis* and other low plants; local. *Rochester district, Birch Wood, Chatham, Sheerness, Maidstone, Dartford, Dover*

Miarus graminis, Gyll. Chalky hillsides, in flowers of *Campanula glomerata*; very local and not common. *Cuxton Downs*

— *plantarum*, Germ. On *Linaria vul-*

CURCULIONIDÆ (continued)

garis, Lotus, etc.; very local and not common. *Darland Hill, Chattenden, Darenth, Greenhithe, Dartford*

Gymnetron villosulus, Gyll. Marshy places, on *Veronica anagallis*; rare. *Snodland, Deal*

— *beccabungæ*, L. Marshy places, on *Veronica beccabungæ* and *Scrophularia aquatica*; very local. *Snodland, Eastry, Dartford, Maidstone, Dover*

— *melanarius*, Germ. On *Veronica*, in woods, lanes, etc.; local. *Darenth and Birch Woods, Chatham, Faversham, Sevenoaks, Folkestone*

— *rostellum*, Herbst. Damp places by sweeping, *Matricaria*, *Achillea*, etc.; rare. *Darland Hill and Wigmore Wood* (rarely by sweeping under fir trees, J. J. W.), *Birch Wood, Lee, Faversham*

— *pascuorum*, Gyll. Chalky and sandy places, by sweeping; local, but not uncommon. *Sevenoaks, Tunbridge Wells, Pegwell Bay, Deal, Folkestone*

— *labilis*, Herbst. On the chalk, by sweeping; very local. *Chattenden, Chatham, Folkestone*

— *antirrhini*, Payk. (noctis, *Brit. Coll.*). On *Linaria vulgaris*; local. *Rochester district, common; Dartford, Birchington, Deal*

— *collinus*, Gyll. On *Linaria vulgaris*; very rare. *Charlton pits* (S. Stevens)

— *linariæ*, Panz. Rare. *Charlton pits* (S. Stevens)

Mecinus pyrastrer, Herbst. On species of *Plantago*; common everywhere

— *circulatus*, Marsh. On species of *Plantago*; rare. *Darland Hill, Chatham, Sheerness*

— *collaris*, Germ. Salt marshes, on *Plantago coronopus* and *P. maritima*; rare. *Rochester district, Gravesend, Sheerness*

Anthonomus ulmi, De G. On and under elms; not common. *Chattenden, St. Mary Cray, Lee*

— *rosinæ*, Des Gozis. On the hawthorn; rare. *Chattenden Roughs*

— *pedicularius*, L. On hawthorn; generally common

— *chevolati*, Desb. On the hawthorn and the service tree; rare. *Sydenham and Darenth Wood* (Power), *Chattenden Roughs* (Walker), *Deal* (Hall)

— *rubi*, Herbst. On various species of *Rubus* and *Rosa*; common and generally distributed

INSECTS

CURCULIONIDÆ (continued)

- Nanophyes lythri*, F. On the purple loosestrife (*Lythrum salicaria*); local, but occasionally in profusion, and widely distributed.
- Cionus scrophulariæ*, L. On *Scrophularia* and *Verbascum*; very local. *Darenth Wood*
- *tuberculosis*, Scop. On the same plants as the preceding; very local and not common. *Lee, Greenwich*
- *hortulanus*, Marsh. On the same plants in chalky districts; common
- *blattariæ*, F. On the same plants; local, but not uncommon
- *pulchellus*, Herbst. On *Scrophularia nodosa*; local, but occasionally found in abundance and not uncommon
- Orobitis cyaneus*, L. Sandy and chalky places, chiefly the latter; on *Orobis*, and in moss in winter; not uncommon and widely distributed
- Cryptorrhynchus lapathi*, L. On willows, especially in osier beds; local, but not uncommon. *Chatham, Upnor, Ramsgate, Dover*
- Acalles roboris*, Curt. By beating dead twigs of oaks, hedges, etc. *Queendown Warren*, by sweeping under beech trees; *Darenth Wood, Bexley, Deal*
- *ptinoides*, Marsh. On heaths, by beating dead branches of fir, etc.; not uncommon. *Bexley, Rochester district, Chatham, Plumstead, Wickham Wood, Tonbridge, Kingsgate, Deal*
- *turbatus*, Boh. By beating dead hedges; in poplar faggots, etc. *Rochester district, Darenth Wood, Lee, Dartford, Gravesend, Deal*
- Coeliodes rubicundus*, Herbst. On young trees, especially birch, also by sweeping; not common. *Darenth Wood, Faversham, West Wickham, Birch Wood, Belvedere*
- *quercus*, F. On young oaks; not uncommon
- *ruber*, Marsh. On young oaks; not uncommon
- *erythroleucus*, Gmel. (*subrufus*, Herbst). On young oaks, etc.; not common. *Darenth Wood, Birch Wood, Charlton, Maidstone*
- *cardui*, Herbst. (*fuliginosus*, Marsh.). By sweeping, in moss, on roads and pavements, etc.; common everywhere
- *quadrimaculatus*, L. On the common nettle; very common everywhere

CURCULIONIDÆ (continued)

- Coeliodes exiguus*, Ol. Chalky and sandy places, especially near the coast; on various species of *Geranium*; local, but not uncommon, and widely distributed
- Poophagus sisymbrii*, F. Marshy places, on watercress and other *Cruciferae*; not uncommon. *Snodland, Rainham, Hythe*
- *nasturtii*, Germ. In ditches, on watercress; very scarce. *Hythe*
- Ceuthorrhynchus assimilis*, Payk. On various *Cruciferae*; generally distributed and common
- *syrites*, Germ. By sweeping herbage; very rare. *Birch Wood*, on *Silene inflata* (Power); *Erith*
- *setosus*, Boh. Sandy places, on *Iberis amara* and *Nasturtium officinale*; extremely local. *Dartford*
- *constrictus*, Marsh. On *Erysimum alliarium* (hedge mustard); local, but not uncommon, and widely distributed
- *cochleariæ*, Gyll. On *Cardamine pratensis* and *Cochlearia officinalis*; local, but sometimes in abundance and widely distributed
- *ericæ*, Gyll. On ling and heather; very common on heaths
- *erysimi*, F. On *Erysimum* and other *Cruciferae*; generally distributed and common
- *contractus*, Marsh. On *Cruciferae*; very common
- *cyanipennis*, Germ. On *Sisymbrium officinale*, *Erysimum alliarium*, etc.; locally common and widely distributed
- *chalybæus*, Germ.¹ On *Sisymbrium officinale* and other *Cruciferae*; local, but not uncommon where it occurs, and widely distributed
- *hirtulus*, Germ. On *Sisymbrium*, etc.; rare. *Deal*
- *suturrellus*, Gyll. On *Cardamine pratensis* and *C. amara*; very rare. *Snodland* (Walker and Champion), *Hythe* (Tylden), *Bearsted* near *Maidstone* (Gorham)
- *pilosellus*, Gyll. By sweeping; food plant apparently not known; very rare. *Birch Wood, Charlton, Plumstead, Deal*

¹ The variety *viridipennis* (*C. viridipennis*, Bris.) has been taken by Mr. Champion at Whitstable on *Mercurialis perennis*. It may be a separate species.

A HISTORY OF KENT

CURCULIONIDÆ (continued)

- Ceuthorrhynchus quadridens, Panz. On various Cruciferæ; common
- geographicus, Goeze (echii, F.). On *Echium vulgare*; local. *Halling Downs, Whitstable, Deal, Dover, Sandgate*
- pollinarius, Först. On nettles; common everywhere
- viduatus, Gyll. On *Stachys arvensis*; rare. *Sheerness*
- pictaris, Gyll. On various Cruciferæ; local, and as a rule rare. *Erith, Darent Wood, Belvedere* (in plenty), *Chatham Hill, St. Mary's Island, Saltwood, Bearsted, Sheerness, Folkestone, Hythe*
- pleurostigma, Marsh. On Cruciferæ; common everywhere
- alliaria, Bris. On *Erysimum alliaria*; local. *Wigmore Wood, Snodland, Cobham Park, Chatham, Maidstone, St. Mary Cray, Folkestone*
- rapæ, Gyll. On *Sisymbrium officinale*; rare. *Lee, Lewisham, Belvedere*
- resedæ, Marsh. On *Reseda luteola* and *R. lutea*; very local, and as a rule rare. *Chatham, Strood, Greenhithe, Gravesend, Dover, Deal*
- punctiger, Gyll. On the dandelion, mostly on the chalk; rare. *Snodland, Darent, Deal, Hythe*
- marginatus, Payk. By sweeping; the larva lives in the heads of *Hypochæris*; local, but found in a large number of places, and not uncommon in the county
- urticæ, Boh. On nettles and *Stachys*; rare. *Snodland, Maidstone*
- rugulosus, Herbst. Marshy places, on *Corymbiferæ*; not uncommon, and widely distributed
- melanostictus, Marsh. On species of *Labiata*; not common. *Lee, Bearsted, Folkestone*
- asperifoliarum, Gyll. On various *Boraginaceæ* (*Echium, Cynoglossum*, etc.); not uncommon
- euphorbiæ, Bris. By sweeping; food plant somewhat doubtful; rare. *Darent (Power), Dartford and Deal (Champion)*. Mr. S. Stevens found it on *Veronica*
- chrysanthemi, Germ. On *Chrysanthemum leucanthemum* (ox-eye daisy); local. *Chattenden Roughs, Lee, Maidstone, Dover, Folkestone*
- triangulum, Boh. On *Achillea millefolium*; rare. *Birch Wood (S.*

CURCULIONIDÆ (continued)

- Stevens), Deal (Champion and Garneys), Folkestone (Power)*
- Ceuthorrhynchus litura, F. On thistles; common and widely distributed
- trimaculatus, F. On thistles; local, and much less common than the preceding. *Rochester district*, not rare; *Dover, Folkestone*, etc.
- Ceuthorrhynchidius floralis, Payk. On various species of *Cruciferæ* (*Capsella, Erysimum*, etc.); common and generally distributed
- hepaticus, Gyll. On *Brassica cheiranthus* and other *Cruciferæ*; rare. *Darland Hill and Faversham (Walker), Easry and Wingham (Gorham)*
- pyrrorhynchus, Marsh. On *Sisymbrium officinale*; local, but not uncommon
- nigrinus, Marsh. By sweeping, chiefly on the chalk; local. *Rochester district*, general; *Dartford, Faversham, Maidstone*
- melanarius, Steph. In marshy places, on *Nasturtium officinale*; local. *Snodland, Lee, Staple, Sandwich, Hythe*
- terminatus, Herbst. On *Daucus maritimus*; local. *Rochester district*, rare; *Whitstable, Dover, Folkestone, Hythe*
- horridus, F. On thistles; very local. *Rochester district*, not uncommon; *Sheerness, Whitstable, Dover, Folkestone*
- distinctus, Bris. By sweeping; rare. *Dover*
- quercicola, Payk. By sweeping; local and seldom abundant, but somewhat widely distributed
- troglodytes, F. On plantain; common everywhere
- chevrolati, Bris. On *Achillea millefolium*; very local. *St. Mary's Island* (in plenty in 1898), *Blue Bell Hill, Lee, Birch Wood, Deal, Dover, Hythe*
- rufulus, Duf. (*frontalis*, Bris.). On *Achillea millefolium* and *Plantago lanceolata*; very local. *Darland Hill, Sheerness, Whitstable, Kingsgate*
- dawsoni, Bris. On *Plantago coronopus*, and perhaps *P. maritima*; also at roots of *Reseda* with the preceding species; very local. *Darland Hill, Strood, Dover, Folkestone*
- Amalus hæmorrhous, Herbst. In moss and by sweeping; generally distributed

INSECTS

CURCULIONIDÆ (continued)

- Rhinoncus pericarpus*, F. On Polygonum, dock, thistles, etc.; common and generally distributed
- *gramineus*, F. Marshy places; on Polygonum; very local. *Snodland, West Wickham, Deal, Sandgate*
- *perpendicularis*, Reich. In damp places; on species of Polygonum; rather common and widely distributed
- *castor*, F. In sandy places; at roots of docks, etc.; generally distributed and common
- *denticollis*, Gyll. Chalky and sandy places, by sweeping; also in grass tufts in winter; rare. *Darland Hill, Blue Bell Hill, Chattenden, Cobham Park, Hythe*
- Eubrychius velatus*. In stagnant or slowly moving water; on Potamogeton, etc.; rare. *Whitstable*
- Litodactylus leucogaster*, Marsh. As the preceding; local, but not uncommon and widely distributed
- Phytobius waltoni*, Boh. Very scarce; sparingly in a dried up ditch at *Snodland* (J. J. W.)
- *quadrituberculatus*, F. Marshy places; not uncommon and widely distributed
- *canaliculatus*, Fahr. Marshy places, on aquatic plants; also by sweeping; very local. *Blue Bell Hill and Cobham Park*, rare; *Sheerness*
- *quadricornis*, Gyll. On aquatic plants, especially Polygonum lapathifolium; rare. *Sheerness* (Walker)
- *quadrinodosus*, Gyll. On aquatic plants, especially Polygonum amphibium; very rare. *Lee* (Power and Champion)
- Limnobaris T-album*, L. In damp meadows; not uncommon. *Rochester* district, common; *Faversham, Maidstone*
- Baris laticollis*, Marsh. On Cruciferae; as a rule rare. *Charlton, Deal, Folkestone* (common)
- *pivicornis*, Marsh. On Reseda lutea; local, but sometimes abundant, and widely distributed
- *lepidii*, Germ. Marshy places, especially on the sandy banks of rivers; also in grass, at roots of Tanacetum, etc.; very local, but not uncommon. *Cobham Park, Snodland, Shooters Hill, Lewisham, Bearsted, Dover*
- *scolopacea*, Germ. Salt marshes; by sweeping the sea purslane (*Atriplex*

CURCULIONIDÆ (continued)

- portulacoides*) and other plants; extremely local and usually very rare. *Sheerness* (Champion and Walker)
- Balaninus venosus*, Grav. On oaks, in woods and hedges; not uncommon
- *nucum*, L. On hazel; common
- *turbatus*, Gyll. On oak, hazel, etc.; not common. *Rochester* district, widely distributed but scarce; *Darenth and Birch Woods, Westerbam, Sheerness*
- *betulæ*, Steph. On birch; very rare. *Plumstead* (S. Stevens)
- *villosus*, F. On oaks and hazels, also on hawthorn blossom; local. *Chattenden, St. Mary Cray, Darenth and Birch Woods, Whitstable*
- *salicivorus*, Payk. On willows; common
- *pyrrhoceras*, Marsh. On oak, hazel, willow, etc.; much less common than the preceding. *Chattenden, Lee, Greenwich, Darenth Wood*, and probably widely distributed
- Calandra granaria*, L. In granaries, bakers' shops, etc.; only too common
- *oryzæ*, L. With the preceding; plentiful in granaries in *Rochester, Strood, Rainham*, etc.
- Cossonus ferrugineus*, Clairv. In decaying willows, elms, oaks, etc.; not common. *Greenwich*
- Rhyncolus lignarius*, Marsh. In decaying elms, oaks, ivy, etc.; common
- *ater*, L. In decaying fir, also in elm; rare. *Darland Hill, Sittingbourne*
- Caulotrypis æneopiceus*, Boh. In old posts, old wine casks, etc.; very scarce. *St. Margaret's Bay, Deal*
- Codiosoma spadix*, Herbst. In old posts on the seashore and on the banks at the mouths of large rivers; locally common. *Gravesend, Sheerness, Pegwell Bay*
- Magdalis armigera*, Fourc. (*atramentaria*, Marsh.). By beating dead hedges; also on elms; not uncommon. *Chattenden* (in profusion, 24 May, 1894, J. J. W.), *Lee, Darenth Wood, Belvedere, Plumstead, Sheerness, Whitstable*, etc.
- *cerasi*, L. In dead hedges and by sweeping; not uncommon
- *pruni*, L. As the preceding; common
- *barbicornis*, Latr. By beating hedges and by sweeping; rare. *Lee, Lewisham, Darenth Wood, Ashford, Chattenden*

A HISTORY OF KENT

SCOLYTIDÆ

- Scolytus destructor*, Ol. In elms; only too common
- *pruni*, Ratz. In decaying apple, cherry and other fruit trees; rare. *Lower Rainham* (J. J. W.); *Tonbridge* (Horner)
- *intricatus*, Ratz. In decaying oak; rare. *Cobham Park*, *Darenth Wood*
- *rugulosus*, Ratz. In decaying oak, cherry, apple, pear, elm, etc.; very local. *Cobham Park* (by sweeping), *Chatbam*, *Birch* and *Darenth Woods*, *Whitstable*
- *multistriatus*, Marsh. As the preceding; local, but not uncommon. *Birch* and *Darenth Woods*, *Sheerness*
- Hylastes ater*, Payk. Under bark of pines, and by sweeping under Scotch firs; locally common. *Darland Hill*, *Chatbam*
- *cunicularius*, Er. In decaying firs; local and scarce. *Westerham*
- *opacus*, Er. In and under decaying firs; not uncommon locally. *Darland Hill*, *Wickham*, *Tonbridge*
- *palliatu*s, Gyll. As the preceding. *Darland Hill*, *West Wickham*
- Hylastinus obscurus*, Marsh. On broom and furze, also on clover, *Ononis*, etc.; local. *Birch* and *Darenth Woods*, *Sheerness*, *Gravesend*, *Dartford*, *Bearsted*, *Folkestone*
- Hylesinus crenatus*, F. In decaying ash trees; as a rule rare, but sometimes common where it occurs. *Cobham Park*, *West Wickham*, *Abbey Wood*
- *oleiperda*, F. In decaying ash, also by sweeping; local. *Cobham Park*, *Sheerness*
- *fraxini*, F. In decaying ash, also by sweeping; generally distributed and common
- *vittatus*, F. In decaying elms; very local. *Greenwich*, *Wickham*
- Myelophilus piniperda*. In and under decaying firs; very local. *Darland Hill*, *Chatbam*
- Cissophagus hederæ*, Schmidt. In decaying ivy; not common. *Darland Hill*, *Cobham Great Wood*, *St. Mary Cray*, *Dartford*

SCOLYTIDÆ (continued)

- Phloeophthorus rhododactylus*, Marsh. In dead stems of furze, broom, etc. *Darland Hill* and *Chattenden*, rare; not however uncommon in several other localities, and widely distributed
- Cryphalus abietis*, Ratz. In dead shoots of the Scotch fir; very rare. *West Wickham Wood* (Champion)
- Magdalis fagi*, Nord. In decaying beeches; very rare. *Westerham* (Gorham), *Tonbridge* (Horner)
- Pityophthorus pubescens*, Marsh. In dead twigs of the Scotch fir, also by sweeping underneath the trees; locally common and widely distributed
- Xylocleptes bispinus*, Duft. In dead stems of *Clematis vitalba*; locally common and widely distributed
- Dryocætes villosus*, F. In decaying oaks; also sometimes in chestnuts and hollies; common and generally distributed
- *coryli*, Perris. In dead twigs and branches of hazel and hornbeam, also by sweeping; very rare. *Darenth* and *Birch Woods*, *Chattenden*, and near *Cuxton*
- Taphrorychus bicolor*, Herbst. In decaying oaks; very rare. *Down*, near *Beckenham* (Crotch); *Darenth Wood* (Champion)
- Tomicus laricis*, F. In decaying larches; not common. *Westerham*
- Trypodendron domesticum*, L. In hard dead wood of beech, alder, birch, oak and other trees; rare. *Westerham*, *Brasted*
- Xyleborus dryographus*, Ratz. In decaying oak and beech; rare. *Abbey Wood*
- *saxseni*, Ratz. In oak, beech, apple, hornbeam and other trees; scarce. *Cobham Park*, in a sound oak log

STYLOPIDÆ

A number of *Halicti* infested with apterous Strepsipterous females were once found by Sir S. S. Saunders at *Folkestone*. These probably belonged to the very rare *Halictophagus curtisii*, Dale, but no male was discovered

LEPIDOPTERA

Butterflies and Moths

Kent was formerly a paradise for collectors of insects of this order, and in the old days no county produced a larger number of species or a

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greater abundance of specimens; but over cultivation, over population, the destruction of old woods, drainage and the spread of the metropolitan area with its buildings and smoke have, during the last half a century, considerably reduced the numbers of species and specimens, at any rate in the north-western part of the county, which has been almost absorbed by London suburbs. Such species however as occur in this country chiefly by immigration from the continent are more commonly taken in the south-east, east and north-east of Kent than in any other part of the United Kingdom.

RHOPALOCERA

*Butterflies*¹

The Wood White (*Leucophasia sinapis*, L.) was formerly common in many woods in the county, and has been recorded from the Blean Woods² between Canterbury and Herne Bay, from Sturry, Pembury, Watlingbury,³ Tunbridge Wells, Tenterden, and from Darenth and Birch Woods. From the two localities last named and from the rest of the metropolitan district it has long disappeared. It still occurs sparingly in some of the woods in the county, but is extinct in most of the localities where it was formerly common.

The Black-veined White (*Aporia cratægi*, L.) was, up to five-and-thirty or forty years ago, a common species in the county, occurring plentifully about Sheerness, Ramsgate, Herne Bay, Wye, Ashford, Selling, Shottenden, Sturry, Maidstone, Chattenden, Rochester and Strood. Excepting in an orchard district in east Kent, it disappeared from the county about 1868 or 1869 and is now practically extinct in Kent, as it is in Sussex, Hampshire, Gloucestershire, Northamptonshire, Huntingdonshire, Monmouthshire, Glamorganshire and other counties where it formerly abounded. Possibly, if unmolested, the species⁴ may increase its area and be again established in the county under favourable climatic conditions. The Large Cabbage White (*Pieris brassicæ*, L.), the Small Cabbage White (*P. rapæ*, L.) and the Green-veined White (*P. napi*, L.) are generally distributed throughout the county and are more or less abundant according to the season. That rare butterfly the Bath White (*P. daphidice*, L.) has been

¹ Stragglers of the Swallow-tail (*Papilio machaon*, L.) have occasionally been captured or observed on the north-east, east and south-east coast, as about Herne Bay, Ramsgate, Deal and Dover. Dr. Knaggs in his *Macro-Lepidoptera of Folkestone* (1870) says, 'Machaon has been met with year after year on the East Cliff, Dover, beyond the castle.' Mr. A. B. Farn informs me that a few larvæ were found feeding on rue in a herbalist's garden at Stone near Dartford in 1874, and the larvæ have also several times been found in the neighbourhood of Faversham. At the present day the species in a truly wild condition, in this country, is confined to Wicken Fen, Cambridgeshire, and to the fens in the Norfolk Broads. The specimens seen or captured in Kent in recent years were doubtless immigrants from the continent, or escapes.—H. G.

² Mr. Charles Fenn records the species from the Blean Woods.—H. G.

³ Mr. Edward Goodwin of Canon Court, Watlingbury, states that Mr. R. H. Fremlin used to take this species commonly at Watlingbury forty years ago, but that it has long been extinct there.—H. G.

⁴ Mr. A. B. Farn says it was very abundant in the Chattenden woods in the late 'fifties,' and there was no difficulty in collecting the pupæ from the stems of the blackthorn.—H. G.

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recorded more frequently from Kent than from any other part of the United Kingdom, and many specimens have from time to time been taken in all parts of the county, especially about Broadstairs, Margate, Ramsgate, Sandwich, Deal,¹ Dover, Folkestone and Hythe. This species, being common on the continent of Europe, would naturally be more frequently found in Kent owing to its proximity to the continent than in other English counties. The Orange Tip (*Anthocharis cardamines*, L.) is generally distributed in lanes, roadsides, fields and woods. The Brimstone (*Gonepteryx rhamni*, L.) occurs throughout the county and is common in most woods and other places where its food plant is plentiful. The Clouded Yellow (*Colias edusa*, Fb.) is generally distributed throughout the county, and is, in certain seasons, abundant on the chalk downs and on railway banks, and in clover and lucerne fields, especially on the coast about Dover, Folkestone, Deal, Sandwich, Margate, Herne Bay, Westgate, Broadstairs and Ramsgate. It is also plentiful nearer London, as at Strood, Greenhithe and Dartford, and even in the metropolitan district in certain seasons. The white variety of the female (var. *belice*) generally occurs with the type more or less commonly, and I have taken several forms of great interest near Dover. The Pale Clouded Yellow (*C. hyale*, L.) is generally distributed throughout the county and is in some years abundant about Margate, Ramsgate, Deal, Dover and Folkestone. It also occurs inland as at Maidstone, Yalding, Ashford and Wye; in the metropolitan district about Dartford, Greenhithe and Eltham, and even close to London. I found it commonly near Dover and Folkestone in 1888. The Silver-washed Fritillary (*Argynnis paphia*, L.) occurs in some of the Kentish woods, but it is not abundant as it is in the New Forest and in the Forest of Dean. I am not aware of the occurrence in Kent of the melanic variety of the female (var. *valezina*),² but the late Mr. Ramsay Cox reported having on one occasion seen a specimen in a wood near Sturry. The Dark Green Fritillary (*A. aglaia*, L.) is generally distributed throughout the county both on the chalk hills and in the wooded part of the weald. It is common on the North Downs between Canterbury and the North Foreland and about Folkestone, Dover, Otford, Shoreham, West Wickham and everywhere on the downs. I have found it abundantly at the base of the downs to the north of Folkestone and between Folkestone and Dover. The High Brown Fritillary (*A. adippe*, L.)³ is not so generally distributed as the last species, but it is not uncommon in some localities near Watlingbury and near Sevenoaks. It also occurs in Kingswood and Penny Pot Woods, between Wye and Canterbury. I have taken it in Eastwell Park

¹ Colonel Swinhoe about six years ago recorded in the *Entomologist* the capture of three specimens at Deal.—H. G.

² I doubt the occurrence of this variety in Kent. In my experience it is confined to the New Forest, where it is, in some seasons, very common. I have never seen it in the Forest of Dean in Gloucestershire or on the banks of the Wye. It has been reported as occurring singly in Devon, Dorset and Sussex.—H. G.

³ Mr. Farn records the capture of one specimen at Chattenden Woods in 1876, and Mr. Fenn says it formerly occurred at Darenth. Mr. Goodwin says it is fairly common near Watlingbury.—H. G.

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near Wye, and it has been reported from the Blean Woods between Canterbury and Herne Bay, from West Wickham and elsewhere in the county. The Queen of Spain Fritillary (*A. latbonia*, L.), which though very rare in this country is a common continental species, has been taken more frequently in Kent than in any other part of the United Kingdom. Many specimens have in the last fifty years been captured near Birch Wood, Darenth Wood, Gravesend, Milton, Shoreham, Herne Bay, Margate, Ramsgate, Deal, Walmer, Dover and Folkestone. The capture of thirteen specimens near Canterbury in 1868 has been recorded, and Mr. Sydney Webb states that eighteen specimens were taken near Dover in September, 1880. The number of captures of this species in Kent is no doubt due to the proximity of the county to the continent of Europe. The Pearl-bordered Fritillary (*A. euphrosyne*, L.) is generally distributed in the woods of the county except in the metropolitan district, where it has, in common with the majority of other butterflies, become extinct or extremely rare in consequence of the extension of buildings, drainage, London smoke and over cultivation. The Small Pearl-bordered Fritillary (*A. selene*, Schiff.) has long since disappeared from most of the woods near London, but it still occurs, more or less commonly, in the Blean Woods, near Herne Bay, in most of the woods between Wye and Canterbury, and in the southern and south-western side of the county near Tenterden. That very local species the Greasy Fritillary (*Melitæa aurinia*,¹ Rott.) occurred formerly in great abundance in the Ham Marshes near Sandwich, but owing to the rapacity of London and Canterbury dealers it gradually became scarcer, until in 1888 or 1889, in consequence of the drainage of the low-lying meadows, in which it used chiefly to occur, it almost disappeared, and at the present time is practically extinct. I am unaware of the occurrence of this local species in any other part of the county. The Pearl-bordered Likeness or Heath Fritillary (*M. athalia*, Rott.) used to be abundant in the Blean Woods near Canterbury, and in the south-west of the county in Knock Wood and other woods near Tenterden, and elsewhere on the borders of Sussex. It also occurred in other woods in the Weald, and was abundant in Chattenden Woods near Rochester, but disappeared suddenly from this locality some thirty years ago. It may still occur near Tenterden and in other woods on the borders of Sussex. The Small Tortoiseshell (*Vanessa urticæ*, L.) is common throughout the county. The Large Tortoiseshell² (*V. polychloros*, L.) is generally distributed and sometimes common, but is much less abundant than formerly.

¹ The Granville Fritillary (*Melitæa cinxia*, L.) is recorded by the late Mr. W. O. Hammond as having formerly occurred about the cliffs near St. Margaret's Bay and near Folkestone. I have no knowledge of its occurrence anywhere in England within the last forty years except in the Isle of Wight. Mr. Ulyett also includes *M. aurinia* in his list of 'Folkestone Lepidoptera.' If it ever occurred between Folkestone and Dover it has been long extinct.—H. G.

² The Comma Butterfly (*Vanessa c-album*, L.) is said to have been common in the hop gardens about eighty or ninety years ago. Mr. Sydney Webb says that although it has now no fixed abode in the county a few specimens are annually captured to the east and west of Dover. It has been taken near Walmer and Alkham, and also at Shepheardswell in 1894. The specimens are no doubt immigrants from the continent.—H. G.

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It occurs in the London district and has also been found near Tenterden, Tonbridge, Canterbury, Wye, Ashford, Faversham, and in many other places in the county. Captain Savile Reid says it is rare about Yalding and Maidstone. The rare Camberwell Beauty (*V. antiopa*, L.) occurs perhaps more frequently in Kent—from its proximity to the continent—than in any other English county. Lewin, an old naturalist, reported that in the middle of August, 1789, he saw two specimens near Faversham, one of which he had the good fortune to take, and in the course of a week he was agreeably surprised with seeing and taking many of them in the most perfect condition. Captures of this species have, during recent years, been made near Dover, Maidstone, Folkestone, Charlton, Lee and Eltham.¹ Mr. Goodwin says he has twice seen it near Watlingbury, and he records the capture of a fine specimen on 18 August, 1898, at East Farleigh. Captain Savile Reid states that a specimen was taken near Yalding in 1889 and another specimen in the same year near Maidstone. The Peacock (*V. io*, L.) was formerly an abundant species and generally distributed, but it has for many years past been gradually disappearing and has become in many places a comparatively scarce species. The Red Admiral (*V. atalanta*, L.) is generally distributed and often common even in metropolitan gardens. The Painted Lady (*V. cardui*, L.) occurs in some seasons all over the county, but is generally most plentiful in clover and lucerne fields, especially near the coast. The Purple Emperor (*Apatura iris*, L.²) formerly occurred in most of the oak woods in the Weald and elsewhere, but it has become rare for years past, and has entirely disappeared from many woods where it used to be abundant. It has long been extinct in the London district. I found it in abundance in 1876, 1877 and 1878 in Chattenden Woods, about four or five miles north from Rochester. It has however since died out or been exterminated there. It has also been taken near Tenterden, Pembury,³ Ashford, Wye, Canterbury, Selling, Sevenoaks, and various parts of the Weald. Mr. Goodwin says it formerly occurred in the Mereworth Woods near Maidstone and was common near Cranbrook in 1883. The Marbled White (*Arge galathea*, L.) is locally plentiful in many parts of the county. I have taken it in abundance in Eastwell Park near Wye, and it occurs commonly on the chalk near Watlingbury, Shoreham and Strood. It is abundant along the eastern and south-eastern coasts near Ramsgate, Deal, Walmer, Dover and Folkestone. The Wood Argus (*Satyrus egeria*, L.) is generally distributed in woods and lanes throughout the county, but according to Captain Savile Reid and Mr. Goodwin it is gradually disappearing. The Wall (*S. megæra*, L.) is

¹ The most recent capture of *Vanessa antiopa* was made by Mr. A. H. Jones at Eltham in the autumn of 1901.

² The occurrence of the White Admiral (*Limenitis sybilla*, L.) has been recorded from Tenterden and also from the borders of Sussex. Mr. Farn says it was plentiful in Chattenden Woods in the late fifties, but disappeared about the same time as the Black-veined White. I have not heard of its capture in this county during the last forty years, and do not think it can now be regarded as a Kentish species.—H. G.

³ It was formerly common at Pembury, and may still occur there.—H. G.

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generally distributed, but Mr. Charles Fenn says it is gradually disappearing from the London district. The Grayling (*S. semele*, L.) is locally common on the chalk hills; Mr. Fenn says it occurs plentifully near Deal and Folkestone, and I have taken it near Dover. The Meadow Brown (*S. ianira*, L.) is generally common in meadows, marshes, and on the hillsides. The Large Heath (*S. titbonus*, L.), so common in most places, is not universally distributed in the county, for according to Mr. Webb it does not occur within eight miles of Dover. I have not found it near Dover or Walmer, but it is reported from Bekesbourne near Canterbury and other parts of the county. Mr. Fenn says it is not common as a rule on the coast, and that it is fast disappearing from the neighbourhood of London. The Ringlet (*S. hyperanthus*) is not scarce in the county and has been taken commonly near Sevenoaks, Shoreham, and in most of the woods in the Weald. The Small Heath (*Chortobius pampbilus*, L.) is everywhere common in fields, marshes and hillsides. The Green Hairstreak (*Thecla rubi*, L.) is generally distributed in suitable places, but has disappeared from the London district. Captain Savile Reid says it is common on the chalk hills near Yalding and Maidstone. The Purple Hairstreak (*T. quercus*, L.) is generally distributed in oak woods in the county, but has disappeared from, or become very scarce in, the London district. Mr. Fenn records it from Chattenenden and Chislehurst, Colonel Irby from West Wickham, and Mr. Goodwin says it is common near Watlington. The White Letter Hairstreak (*T. w-album*, Knoch.) is in some years very common in many parts of the county. I have found it abundantly in and near Chattenenden Woods and elsewhere in the neighbourhood of Rochester. Mr. Goodwin reports it from Gravesend. The Brown Hairstreak (*T. betulæ*, L.) has been recorded from woods and lanes about Sheldwick, Dartford, and from Darenth Wood and Birch Wood. From the two latter localities it has long since disappeared. Colonel Irby informed me that he had taken it commonly on the railway banks near Ham Street Station, between Appledore and Ashford. Mr. Sydney Webb states that it also occurs in some years in numbers between Canterbury and Selling. The Small Copper (*Polyommatus phlæas*, L.) is generally distributed throughout the county. I have never met with the Silver Studded Blue (*Lycæna ægon*, Schiff.) in Kent, but Mr. Arthur Rose informs me that he takes it commonly on the chalk near Sevenoaks. It also occurs, or occurred, on Tunbridge Wells Common, in Frant Forest near Tunbridge Wells, and on many parts of the downs, particularly throughout the Dover district. It is also reported as formerly occurring in Darenth and Birch Woods. The Brown Argus (*L. agestis*, Hb.) is generally distributed in the chalk districts throughout the county, and the Common Blue (*L. alexis*, Hb.) is common in most places on the chalk, sand and clay. The Adonis or Clifden Blue (*L. adonis*, Fb.) is locally abundant on the chalk near Shoreham, Folkestone, Dover, Deal, Chilham and elsewhere. The Chalk Hill Blue (*L. corydon*, Fb.) is generally distributed in the chalk districts and is abundant in

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many places near Dover, Folkestone, Deal, Shoreham and elsewhere. The Small Blue (*L. albus*,¹ Fb.) occurs in many places in the chalk district. The Holly Blue (*L. argiolus*, L.) is generally distributed throughout the county along hedgerows and woodsides, and also in gardens where holly and ivy abound. During the past few years it has been a very common metropolitan species, occurring in abundance in suburban gardens. The Duke of Burgundy (*Nemeobius lucina*, L.) occurs in many woods, in the Weald and in the Blean Woods and elsewhere near Canterbury. It also occurs near Wye and Dover, and was formerly common in Darenth Wood, but Mr. Fenn says it has long been extinct there. The Grizzled Skipper (*Syrichthus alveolus*, Hb.) is generally distributed and common in most of the woods in the county. The Dingy Skipper (*Thanaos tages*, L.) is generally distributed on the chalk hills. Mr. Webb states the coast form is whiter and more brightly-coloured than inland specimens. The Large Skipper (*Hesperia sylvanus*, Esp.) is of common occurrence throughout the county. The Silver Spotted Skipper (*Hesperia comma*, L.) is locally common near Canterbury, Deal, Dover, and in many places on the chalk hills. The Small Skipper (*H. linea*, Fb.), is common everywhere, and *H. lineola*, which was originally detected in this country in east Essex, has been recorded by Mr. Farn, Mr. Fenn and others from the Cliffe Marshes, north-east of Gravesend.

HETEROCERA

Moths

Kent contains a great number of interesting moths which ought to receive a detailed notice, but, in consequence of the limited space which can be spared in this volume for the Insecta, little more than a list of species, prefaced with a few notes on those which are most local and characteristic of the county, can be published.

The Bedstraw Hawk Moth (*Deilephila galii*, Schiff.), although by no means confined to the county, has perhaps been found more freely in Kent than in any other part of the United Kingdom, except on the coast of Sussex. The larvæ are sometimes comparatively common on the yellow bedstraw in August and September about Folkestone, Dover, Walmer, Deal, Sandwich, Ramsgate and elsewhere along the coast. I bred a good series of the moth in 1889 from the caterpillars I had collected on the Kentish coast in the autumn of 1888. That very rare species *D. livornica*, Esp., has been occasionally found about Folkestone and Dover and also at Lewisham. The Silver-striped Hawk Moth (*Chærocampa celerio*, L.) is commoner and has been taken at Tenterden and many other places in the county. The Oleander Hawk Moth (*C. nerii*, L.), one of the grandest species of Sphingidæ occurring in this country, was taken many years ago at Dover, and Captain Savile

¹ The Mazarine Blue (*Lycæna acis*, Schiff.) is stated by Mr. Tutt to have formerly been taken near Cuxton about 1871. Mr. Farn says he worked the Cuxton district in 1871 and prior to that year, but he never saw this species.—H. G.

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Reid recorded the capture of another specimen at Yalding near Maidstone on September 18, 1900. That very rare Clearwing, *Sesia an'dreniformis*, Lasp., was first taken by Mr. Chant at Greenhithe more than forty years ago, and a few other specimens have since been met with near Chattenden and elsewhere in the county. The beautiful Fiery Clearwing (*S. chrysidiformis*, Esp.) is, in this² county, entirely confined to the undercliff between Folkestone and Dover, where it was first taken about 1856 by the late Mr. Brewer of Reigate. The larvæ feed in the roots of the common dock. I found the species commonly in the Warren some fifteen or sixteen years ago, but it has become much rarer of late years owing to the digging up of the dock roots by London and Folkestone dealers with the object of breeding the species. Another local species is *S. ichneumoniformis*, Fb., which is not uncommon along the coast about Ramsgate, Margate, Deal, Dover and Folkestone. The beautiful little *Nola albulalis*, Hb., formerly occurred in abundance³ in Chattenden Woods near Rochester, where I collected a fine series in 1876. The rare *N. centonalis*, Hb., has been taken near Deal, Dover and Folkestone. One of the most interesting species in the county is the Pigmy Footman (*Lithosia lutarella*, Schiff.) which was first made known as a British species by the late Mr. Henry Doubleday, who named it *L. pygmeola*. It was abundant on the Deal sandhills twenty years ago, but it seems in danger of being exterminated chiefly by man's agency. I am not aware of its occurrence elsewhere in the United Kingdom. The rare *Deiopea pulchella*, L., has been taken near Herne Bay, Margate, Ramsgate, Deal, Walmer, Dover and Folkestone. The beautiful Scarlet Tiger (*Callimorpha dominula*, L.) was formerly very abundant at St. Margaret's Bay, but the locality has much changed and has been partly destroyed by the fall of the cliffs. It still occurs between Walmer and Deal, and sparingly in one or two more inland localities. Another interesting Kentish species is the Ground Lackey (*Bombyx castrensis*, L.), which is very abundant in the Isle of Sheppey and elsewhere in the salt marshes on the banks of the Thames below Erith. One of the grandest of British moths, the Kentish Glory (*Endromis versicolor*, L.), formerly occurred—as is obvious from its name—in the county, but it has long been extinct⁴ in Kent as it has been in Tilgate Forest, between Worth and Balcomb, and in St. Leonard's Forest, between Three Bridges and Horsham in north Sussex. The Large Thorn (*Ennomos autumnaria*, Wernb.) was formerly very rare in this county, but it has in the last twenty years been taken or bred in numbers about Deal, Walmer, Dover and Folkestone. The rare *Acidalia ochrata*,⁵ Scop., was formerly plentiful at Sandwich, but its locality has been almost destroyed by the establishment of the local golf links, and it may disappear. Another local

¹ This is the species referred to by Mr. Stainton in his *Manual* as *Trochilium allantiforme*.—H. G.

² Mr. Webb says this species has also been taken in Sussex and Essex.—H. G.

³ Mr. Fenn says it is still common at Chattenden.—H. G.

⁴ Mr. Goodwin states that Mr. Fremlin found a batch of ova near Wateringbury in 1860, but he knows of no subsequent record of its occurrence in the county.—H. G.

⁵ It also occurs near Southend in Essex. I know of no other localities.—H. G.

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moth is *A. emutaria*,¹ Hb., which occurs in the marshes near Woolwich and elsewhere on the banks of the Thames. Another typical Kentish species is the Black-veined Moth (*Scoria dealbata*, L.²), which is plentiful in several parts of the county, especially about Westwell near Wye and in Chattenden Woods near Rochester. With the exception of one specimen, which I found in a wood near Hailsham in east Sussex, and a few specimens recorded by Mr. T. H. Briggs from Thurning in Huntingdonshire, I am not aware of the occurrence, in this country, of this interesting species out of the county of Kent. That beautiful little species *Sterrha sacaria*, L., has several times been taken near Folkestone, Dover and elsewhere on the Kentish coast. The scarce Chocolate Tip (*Clostera anachoreta*, Fb.) was originally discovered at Folkestone by Mr. Sydney Cooper and Dr. Knaggs. It has since been found at St. Leonards and elsewhere in south Sussex, but the great majority of the specimens in our collections were obtained from Kent. The scarce Prominent³ (*Notodonta carmelita*, Esp.) was formerly found at Birch Wood and still occurs sparingly at West Wickham and near Watlingtonbury.

Coming to the Noctuæ we find that the rare *Leucania albipuncta*, Fb., has been taken more frequently about Folkestone than anywhere else in the United Kingdom. *Tapinostola bondii*,⁴ Knaggs, another species of very limited distribution in Europe, used to be common on the West Cliff at Folkestone. The very rare *Nonagria sparganii*, Esp., has only been taken near Hythe and Deal, and the localities are known to few entomologists. The local *Pachetra leucophæa*, View, has been taken commonly on the Wye Downs, at Westwell, and near Gravesend; and the scarce *Mamestra abjecta*, Hb., has occurred at Dartford and Greenwich and commonly near Gravesend. One of the most interesting Kentish species is *Dianthecia albimacula*, Bork., first taken at Birch Wood in 1816. It has since been captured and bred in abundance from the Warren at Folkestone, where its food plant, the Nottingham catchfly (*Silene nutans*), is plentiful. It also occurs on Shakespeare's Cliff near Dover, and elsewhere on the coast where its food plant occurs. That great rarity *Cucullia gnaphalii*, Hb., was originally taken in Darenth Wood, and the beautiful scarce Burnished Brass (*Plusia chryson*,⁵ Esp.) was first taken at Deal by the late Mr. Harding. *P. moneta*, which is now almost generally distributed, was first taken near Dover. Mr. Webb informs me that the following very rare species have also been taken in the county, viz. *Hydrilla palustris*, H., *Xylina zinckenii*, T., *Micra ostrina*, H., and *Catephia alchymista*, S.V.

¹ It is plentiful in the New Forest in certain swamps, but prior to its discovery there it was looked upon as mainly a Kentish species, though specimens have been recorded from Norfolk.—H. G.

² Mr. H. T. Stainton in his *Manual* mentions Charing and Faversham as localities.—H. G.

³ Colonel Irby records this species from West Wickham, and Mr. Goodwin refers to it as being scarce near Watlingtonbury.

⁴ The species is locally abundant to the west of Lyme Regis on the borders of the counties of Dorset and Devon. Except in this locality I am not aware of its occurrence anywhere in the United Kingdom out of Kent. Dr. Knaggs informs me that it is still common at Folkestone.—H. G.

⁵ *Plusia chryson* (formerly known as *P. orichalcea*, Hb.) has, during the last sixteen or seventeen years, been taken or bred in great numbers from Chippenham Fen near Fordham in east Cambridgeshire.—H. G.

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Many other interesting Kentish species might be referred to in detail if space permitted. The following list of the moths of Kent has been compiled partly from my own notes and partly from those kindly supplied to me by Mr. Albert B. Farn, Mr. Charles Fenn, Mr. Edward Goodwin, Colonel Howard L. Irby, F.L.S., Dr. H. G. Knaggs, F.L.S., Captain Savile G. Reid, R.E., F.Z.S., Mr. J. W. Tutt, Mr. Sydney Webb and other residents in the county. I have also obtained assistance from Stainton's *Manual* and from the lists by Dr. Knaggs and Mr. Ulyett of the Lepidoptera of the Folkestone district.

NOCTURNI¹

Procris statices, L. *Sandwich*,² *Chattenden*, etc.

— *geryon*,³ Hb. *Folkestone*

— *globulariæ*,³ H.b. „

Zygæna trifolii, Esp. *Sandwich*, *Deal*, *Dover*, *Folkestone*, *Wye*, etc.

— *loniceræ*, Esp. *Chattenden*

— *filipendulæ*, L. Generally distributed and abundant at *Deal*, *Dover*, *Folkestone*, *Wye*, etc.

Smerinthus ocellatus, L. } Generally distributed, common in some places
— *populi*, L. }
— *tiliæ*, L. }

Acherontia atropos, L. *Deal*, *Walmer*, *Dover*, *Folkestone*, *Lee*, *Eltham*, *West Wickham*

Sphinx convolvuli, L. *Deal*, *Dover*, *Wateringbury*, *Yalding*, *Lee*, *Eltham*, etc.; common in 1898 and 1901

— *ligustri*, L. Generally distributed, common in some places

Deilephila galii, Schiff. *Sandwich*, *Deal*, *St. Margaret's Bay*, *Dover*, *Folkestone*, etc.; rare

— *livornica*, Esp. *Dover*, *Folkestone*; very rare

Chærocampa celerio, L. *Dover*, *Tenterden*; very rare

— *porcellus*, L. *Deal*, *Dover*, *Folkestone*, *Dartford*, *Greenhithe*, etc.

— *elpenor*, L. *Deal*, *Dartford*, *Greenhithe*, *Erith*, *Tenterden*

Chærocampa nerii, L. *Dover*, *Yalding*; extremely rare

Macroglossa stellatarum, L. Generally distributed, some years very common

— *fuciformis*, L. *Blean Woods*, *Darent*, *Maidstone*, *Wateringbury*; scarce

— *bombylifomis*, Och. *Ham Marshes*, *Sandwich*; very local

Sesia myopiformis, Bork. *Eltham*, *Lee*, *Folkestone*; common in gardens and among wild crab trees

— *culciformis*, L. *Dartford*, *Bexley*, *Folkestone*, etc.; not uncommon amongst birch trees

— *formiciformis*, Esp. *Dartford Marshes*

— *chrysidiformis*, Esp. *The Warren*, *Folkestone*

— *ichneumoniformis*, Fb. *Folkestone*, *Dover*, *Deal*, *Canterbury*, etc.

— *cynipiformis*, Esp. *Darent*, *Bexley*, *Folkestone*, etc.

— *tipuliformis*, Clerck. Generally common in gardens

— *allantiformis*, Wd. *Greenhithe*, *Chattenden*, *Folkestone*, *Shepherdswell*; very rare

— *bembeciformis*, Hb. *Eltham*, *Bexley*, *Folkestone*

— *apiformis*, Clerck. *Dartford*, *Wateringbury*, *Folkestone*

Zeuzera æsculi, L. *Eltham*, *Greenhithe*, *Lewisham*, *Bromley*, *Yalding*, *West Wickham*

Cossus ligniperda, Fb. Generally common

Hepialus hectus, L. Generally abundant

— *lupulinus*, L. „ „

— *sylvinus*, L. *Lee*, *Greenhithe*, *Dover*, *Folkestone*, *Yalding*; not uncommon

— *velleda*, Hb. Formerly common at *Darent*; occurs near *Maidstone* and *Folkestone*

— *humuli*, L. Generally common

Limacodes testudo, Schiff. *Darent*, *Chattenden*

Nola cucullatella, L. Generally common

— *cristulalis*, Dup. *Blean*, *Darent*, *West Wickham*, *Folkestone*

¹ I am especially indebted to Mr. Charles Fenn and to Capt. Savile Reid, R.E., for assistance in the compilation of this list, and to Mr. C. G. Barrett and Mr. Sydney Webb for kindly perusing the same and making additions and suggestions.—H. G.

² The fact that certain localities are mentioned does not imply that a species does not occur elsewhere. A complete list of known localities would occupy far more space than can be spared for Insects in a work like the present.—H. G.

³ These two species are included by Mr. Ulyett in his list of Folkestone Lepidoptera contained in his *Rambles of a Naturalist round Folkestone*, published in 1880, and Mr. Webb says that they still occurred in the district in 1901.—H. G.

A HISTORY OF KENT

- Nola strigula*, Schiff. *Dartford, Greenhithe, West Wickham*
 — *centonalis*, Hb. Formerly at *Deal* and *Folkestone*
 — *albulalis*, Hb. Not scarce at *Chattenden*
Nudaria senex, Hb. *Sandwich, Lee, Eltham, Greenhithe, Dartford*
 — *mundana*, L. Formerly abundant at *Eltham* and *Lee*; *Yalding, Greenhithe, Folkestone*
Setina irrorella, Clerck. *Shoreham, Otford, Folkestone*
Calligenia miniata, Forst. *Erith, Darent, Greenhithe, Yalding, Tenterden*
Lithosia mesomella, Forst. *Chislehurst, Greenhithe, Blean, Yalding, Tenterden, Folkestone*
 — *muscerda*,¹ Hufn. *Ham Ponds near Sandwich*
 — *aureola*, Hb. *Chattenden, Blean, Darent, pygmeola*, Dbl. *Deal*; formerly abundant; getting scarcer
 — *complanula*, Bdv. *Lee, Greenhithe, Bexley, Folkestone, Yalding, etc.*; getting scarce
 — *complana*, L. *Blean, Folkestone, Greenhithe, Abbey Wood, Darent*; scarcer than formerly
 — *griseola*,² Hb. *Sandwich, Greenhithe, Eltham, Yalding*
 — *rubricollis*, L. Formerly at *Darent* and *West Wickham*; near *Folkestone* and *Shepherdswell*. I have no other records, but the species must occur in many other places in the county
Deiopeia pulchella, L. *Dover, Deal, Folkestone, etc.*; rare
Euchelia jacobææ, L. Locally abundant
Callimorpha dominula, L. *Sandwich, Deal*; abundant in some years
Euthemonia russula, L. *Chislehurst, Blean, Yalding*; formerly common near *Wateringbury*
Chelonia plantaginis, L. *Chattenden, Greenhithe, Darent, Blean, Wateringbury, Folkestone, Wye and Shoreham*
 — *caja*, L. Generally distributed, but not so common as formerly
 — *villica*, L. *Deal, Folkestone, Eltham, Greenhithe, Yalding, Wateringbury, etc.*; not common

¹ This species is abundant in Horning Fen, Norfolk. With the exception of the occurrence of a specimen or two in Matley Bog in the New Forest and a few specimens in the Ham Marshes near Sandwich, I am not aware of its existence out of the Norfolk fens.—H. G.

² Mr. Fenn records the occurrence once at Bexley of *Lithosia quadra*, L., Mr. Ulyett includes this species in his list of Folkestone species, and Mr. Webb records it from near Dover.—H. G.

- Arctia fuliginosa*, L. *Eltham, Greenhithe, Wateringbury, Yalding*
 — *mendica*, Clerck. Generally distributed but not abundant
 — *lubricipeda*, Esp. Generally common
 — *menthastris*, Esp. " "
 — *urticæ*, Esp. *Deal, Dartford, Greenhithe, Plumstead*; very local
Liparis chrysorrhæa, L. *Ramsgate, Yalding, Deal, Gravesend, Sheppey, Tenterden*
 — *auriflua*, Fb. Generally abundant
 — *salicis*, L. *Lee, Eltham, Greenhithe, Deal*; common
 — *monacha*, L. *Wateringbury, West Wickham*, not common; formerly at *Darent*
Orgyia pudibunda, L. Occurs generally, but is not very common
 — *gonostigma*,³ Fb. *Bexley* formerly
 — *antiqua*, L. Common everywhere
Demas coryli, L. *Eltham, Folkestone, Wateringbury, West Wickham*; scarce
Trichiura cratægi, L. *Eltham, Folkestone*; scarce
Pæcilocampa populi, L. *Chattenden, Greenhithe, Eltham, Yalding, Wateringbury*
Eriogaster lanestris, L. *Darent, Greenhithe, Sevenoaks*; common in the larval state
Bombyx neustria, L. Generally common; formerly too abundant in the larval state, but now scarcer
 — *castrensis*, L. *Cliffe, Isle of Sheppey*; very local
 — *rubi*, L. Generally distributed, sometimes common
 — *quercus*, L. Generally distributed but getting scarcer
 — *trifolii*, Esp. *Ramsgate, Dover, Dungeness*
Odonestis potatoria, L. Generally common, abundant at *Deal* and some other places
Lasiocampa quercifolia, L. *Lee, Eltham, Greenhithe, Plumstead, Dartford, Yalding, Maidstone, etc.*; scarce
Saturnia carpini, Schiff. *Eltham, Folkestone, Greenhithe, Chislehurst, etc.*; not generally common in *Kent*

GEOMETRÆ

- Urapteryx sambucata*, L. Generally common, abundant in the *London* suburbs
Epione apiciaria, Schiff. *Lee, Eltham, Deal, Dartford, Yalding, Greenhithe, West Wickham, Folkestone*
 — *advenaria*, Hb. *Sevenoaks, Pembury, Wateringbury*; very local
Rumia crategata, L. Generally abundant

³ Mr. C. Fenn records this species from Bexley, but I have no knowledge of its occurrence in Kent.—H. G.

INSECTS

- Venilia maculata*, L. Generally common
- Angerona prunaria*, L. *Chattenden, Greenhithe, Dartford, Watlingbury, Folkestone*
- Metrocampa margaritata*, L. Generally common
- Ellopija fasciaria*, Schiff. In most of the fir woods in the county
- Eurymene dolabraria*, L. *Lee, Greenhithe, Bexley, Eltham, Dartford, Watlingbury, West Wickham, Pembury, Folkestone*
- Pericallia syringaria*, L. *Eltham, Lee, Dartford, Yalding, Pembury, Folkestone, Dover*
- Selenia illunaria*, Hb. Generally common, sometimes abundant
- *lunaria*, Schiff. *Dartford, Bexley, Lee, Eltham, Watlingbury, Yalding, Pembury, Folkestone*
- *illustraria*, Hb. *Eltham, Dartford, Cobham, Watlingbury*
- Odontopera bidentata*, Clerck. Generally common. Mr. Webb says that the Dover specimens often have a distinct black band on the wings
- Crocallis linguaria*, L. Generally common
- Ennomos alniaria*, Esp. *Deal, Dover, Folkestone, Margate*
- *tiliaria*, Bork. *Lee, Eltham, Charlton, Dartford, Deal, Folkestone*
- *fuscantaria*, Haw. *Lee, Eltham, Greenhithe, Charlton, Yalding, Deal, Folkestone*
- *erosaria*, Bork. *Bexley, Eltham, Lee, Yalding, Chattenden, West Wickham, Tenterden*
- *angularia*, Bork. *Lee, Eltham, Bexley, Chislehurst*; generally common
- Hemera pennaria*, L. Generally common
- Phigalia pilosaria*, Hb. " " "
- Nyssia hispidaria*, Fb. *Bexley, Shooters Hill, West Wickham*; very local
- Biston hirtaria*, Clerck. Generally abundant
- Amphidasis prodromaria*, Schiff. *Lee, Bromley, Eltham*
- *betularia*, L. Generally common
- Hemerophila abruptaria*, Thnb. Common in and near London and about Yalding and West Wickham
- Cleora lichenaria*, Hufn. *Deal, Dartford, Yalding, Dover*
- Boarmia repandata*, L. Generally distributed and not uncommon
- *rhomboidaria*, Hb. Generally abundant
- *abietaria*,¹ Hb. *Pembury and Shepherds-well*
- Boarmia roboraria*, Schiff. *Maidstone, Yalding, Watlingbury, West Wickham, Tenterden*
- *consortaria*, Fb. *Dartford, Yalding, Watlingbury, West Wickham, Folkestone*
- Tephrosia consonaria*, Hb. *Yalding, Watlingbury, Sevenoaks, West Wickham, Pembury, Folkestone*
- *crepuscularia*, Hb. *Eltham, Watlingbury, Farnborough, West Wickham, Folkestone*
- *biundularia*, Bork. Generally distributed
- *extersaria*, Hb. *Bexley, Dartford, Watlingbury, West Wickham, Folkestone*
- *punctulata*, Hb. Generally common
- Gnophos obscurata*, Hb. *Shoreham, Otford, Deal, Dover, Folkestone*
- Boletobia fuliginaria*. Has been taken near Deptford, and at Greenhithe by Mr. Farn; very rare
- Pseudoterpna cytisaria*, Schiff. *Erith, Bexley, Abbey Wood, Chislehurst*
- Geometra papilionaria*, L. *Eltham, Bexley, Greenhithe, Yalding, Watlingbury, Chislehurst, Dartford, West Wickham, Pembury, Tenterden, Folkestone*
- *smaragdaria*,² Fb. *Sheppey*; very rare
- Iodis vernaria*, Hb. Generally distributed on the chalk
- *lactæaria*, L. Generally common
- Phorodesma bajularia*, Schiff. *Bexley, Eltham, Erith, Chislehurst, Chattenden, Watlingbury, West Wickham, Folkestone*
- Hemithea thymiaaria*, Gn. Generally common
- Ephyra porata*, Fb. *Dartford, Chattenden, Bexley, Yalding, West Wickham, Folkestone*
- *punctaria*, L. *Dartford, Chattenden, Bexley, Yalding, West Wickham, Folkestone*
- *trilinearia*, Bork. *Sevenoaks, Yalding, West Wickham*
- *omicronaria*, Hb. *Bexley, Chattenden, Dartford, Watlingbury, Pembury, Folkestone*
- *orbicularia*, Hb. Once at *Blackbeath, West Wickham*
- *pendularia*, Clerck. Common at *Pembury, Tenterden*, and many other places
- Hyria auroraria*, Bork. *Ham Ponds, Sandwich*
- Asthena luteata*, Schiff. *Bexley, Chattenden, Yalding, Dartford, Folkestone*
- *candidata*, Schiff. Generally common
- *sylvata*, Hb. *Greenhithe, Eltham, Watlingbury, Tenterden, Folkestone*

¹ Mr. Stainton gives Pembury as a locality for this species in his *Manual*. I have no other record of its occurrence in Kent except Shepherds-well.—H. G.

² Mr. Farn says this species has been found in Sheppey. I am not aware of its occurrence except on the Essex coast.—H. G.

A HISTORY OF KENT

- Eupisteria heparata*, Haw. *Eltham, Bexley, Chattenden, Chislehurst, West Wickham*
- Acidalia ochrata*, Scop. *Sandwich*; formerly abundant
- *perochraria*, Fisch. Near *Dartford*; very rare. Doubtful if ever taken.—H. G.
- *scutulata*, Hb. Generally common, often abundant
- *bisetata*, Hufn. Generally common
- *trigeminata*, Haw. *Lee, Greenhithe, Dartford*
- *rusticata*, Fb. *Greenhithe, near Chattenden, Folkestone*
- *osseata*, Haw. Locally abundant. *Deal*
- *dilutaria*. Common
- *incanaria*, Hb. Generally abundant
- *ornata*, Scop. *Shoreham, Greenhithe, Otford, Yalding, Deal, Folkestone*
- *promutata*, Gn. *Deal, Lee, Folkestone*
- *straminata*, Tr. *Chislehurst, Yalding, etc.*
- *subsericeata*, Haw. *Chattenden, Yalding, Eltham, Dartford, West Wickham*
- *immutata*, L. *Dartford, Gravesend, Deal, West Wickham*
- *remutata*, Hb. Generally common
- *strigillata*, Hb. *Folkestone Warren*. Mr. Webb states that it is now nearly extinct
- *imitaria*, Hb. *Deal, Lee, Bexley, Eltham, Dartford, Yalding, West Wickham*
- *emutaria*, Hb. *Dartford, Deal, Gravesend, Sandwich, New Romney*
- *aversata*, L. Generally abundant
- *inornata*, Haw. *Lee, Eltham, Chislehurst, Bexley, Folkestone*
- *emarginata*, L. *Lee, Eltham, Bexley, Yalding, Folkestone*
- Timandra amataria*, L. *Lee, Eltham, Watlingbury, Yalding, Dartford, Pembury*; common in many places
- Cabera pusaria*, L. Generally common
- „ *var. rotundaria*, Haw. *Folkestone*
- *exanthemata*, Scop. Generally common
- Corycia temerata*, Hb. *Chattenden, Dartford, Yalding, Eltham, West Wickham, Folkestone*
- *taminata*, Hb. *Plumstead, Chattenden, Yalding, Dartford, West Wickham, Folkestone*
- Aleucis pictaria*, Curt. Formerly on *Dartford Heath*
- Macaria notata*,¹ L. *Chislehurst, West Wickham, Dartford, Watlingbury, Yalding, Greenhithe, Pembury, Tenderden*
- *alternata*, L. *Folkestone, Dover, Shepberdswell*. Sometimes commoner than the preceding species, according to Mr. Sydney Webb
- Macaria liturata*, Clerck. *Sevenoaks, Plumstead, West Wickham, Greenhithe*
- Halia wavaria*, Fb. Generally abundant
- Strenia clathrata*, L. *Lee, Eltham, Bexley, Chattenden, Dartford, Deal, etc.*
- Panagra petraria*, Hb. Generally common
- Numeria pulveraria*, L. *Eltham, Bexley, Farningham, Dartford, Folkestone*
- Scodiona belgiaria*, Hb. *Chislehurst, Greenhithe*
- Fidonia atomaria*, L. Generally abundant
- *pinaria*, L. Generally common amongst fir trees
- *conspicuata*, s.v. Formerly abundant at *Greenhithe*, but now extinct according to Mr. Webb
- Minoa euphorbiata*, Scop. *Blean, Dartford, Abbey Wood, West Wickham*
- Scoria dealbata*, L. *Chattenden*, common; near *Watlingbury*, very local; *Westwell Downs* near *Wye*, abundant; *Charing*, near *Faversham*
- Sterrhia sacraria*, L. *Folkestone, Dover, etc.*; very rare
- Aplasta ononaria*,² Fues. *Folkestone*. Mr. Webb says 'Formerly near *Folkestone*; a few specimens taken prior to 1880.' Very rare
- Aspilates strigillaria*, Hb. *Blean, Chattenden, Folkestone*
- *citraria*, Hb. *Dartford, Eltham, Deal, Folkestone*
- *gilvaria*, Fb. *Shoreham, Deal, Dover, Folkestone*; common on the chalk hills
- Abraxas grossulariata*, L. Generally abundant
- *ulmata*, Fb. *Abbey Wood, Folkestone*; rare in the county since 1860, according to Mr. Webb
- Ligdia adustata*, Schiff. Locally common
- Lomaspilis marginata*, L. Generally abundant
- Pachycnemis hippocastanaria*, Hb. *Chislehurst, West Wickham*
- Hybernica rupicaprararia*, Hb. Generally common
- *leucophearia*, Schiff. Generally common
- *aurantiaria*, Esp. *Deal, Eltham, Chislehurst, West Wickham*
- *progemmaria*, Hb. Generally common
- *defoliaria*, Clerck. „ „
- Anisopteryx æscularia*, Schiff. Generally common

¹ Colonel Irby informed me that this species is, or was abundant at West Wickham.—H. G.

² Mr. Ulyett includes this species in his list of *Folkestone Lepidoptera*.—H. G.

INSECTS

- Cheimatobia brumata*,¹ L. Generally far too abundant
 — *boreata*, Hb. Common
Oporabia dilutata. Generally common
Larentia didymata, Bork. Locally common.
Dartford, Yalding, etc.
 — *multistrigaria*, Haw. *Dartford*
 — *olivata*, Bork. *Darentb, Wateringbury*
 — *pectinitaria*, Fues. Generally common
Emmelesia affinitata, St. *Deal, Abbey Wood, Wateringbury, Yalding*
 — *alchemillata*, L. *Dartford, West Wickham, Wateringbury, Yalding*; scarce
 — *albulata*, Schiff. *Bexley, Lee, Chattenden, Wateringbury, Folkestone*
 — *decolorata*, Hb. *Eltham, Erith, Dartford, Wateringbury, Yalding, Folkestone*
 — *unifasciata*, Haw. *Beckenham, Chattenden*
Eupithecia venosata, Fb. *Darentb, Erith, Wateringbury, Folkestone*
 — *linariata*, Fb. *Lee, Sidcup, Eltham, Yalding, Folkestone*
 — *pulchellata*, St. *Darentb, Wateringbury, Yalding, Dungeness Beach*
 — *centaureata*, Fb. Generally common
 — *succenturiata*, L. *Lee, Eltham, Dartford, Yalding*
 — *subfulvata*, Haw. *Lee, Eltham, Dartford, Yalding, Folkestone*
 — *plumbeolata*, Haw. *Lee, Chattenden, Folkestone*
 — *isogrammata*, H.S. *Cliffe, Deal, Folkestone, Dartford*
 — *satyrata*, Hb. *Chattenden, Folkestone*
 — *castigata*, Hb. *Eltham, Bexley, Chattenden, Folkestone*
 — *trisignata*, H.S. *Otford, Sevenoaks*
 — *lariciata*, Frr. *Deal, Dartford*
 — *albipunctata*, Haw. *Lee, Eltham*
 — *pusillata*, Fb. *West Wickham*
 — *pimpinellata*, Hb. *Folkestone*
 — *fraxinata*, Crewe. *Lee, Canterbury, Lewisham, Chattenden, Bexley, Folkestone*
 — *indigata*, Hb. *Abbey Wood, Plumstead, Yalding, Sevenoaks*
 — *nanata*, Hb. *Dartford*; common on heaths
 — *subnotata*, Hb. Generally common
 — *campanulata*, H.S. *Darentb*
 — *vulgata*, Haw. Generally common
 — *expallidata*, Gn. *Darentb, Greenhithe, Yalding, Folkestone*
 — *absynthiata*, Clerck. Generally common
 — *minutata*, Gn. *Yalding, Chislehurst, Dartford*
Eupithecia assimilata, Gn. *Lee, Eltham, Yalding, Folkestone*
 — *tenuiata*, Hb. *Chattenden*
 — *dodoneata*, Gn. *Lee, Eltham*
 — *subciliata*, Gn. *Hythe, Folkestone*
 — *abbreviata*, St. Generally distributed
 — *exiguata*, Hb. *Lee, Eltham, Folkestone*
 — *sobrinata*, Hb. *Blackheath, Wateringbury*
 — *pumilata*, Hb. Generally common
 — *coronata*, Hb. *Dartford, Farningham, Wateringbury, Yalding, Erith, Folkestone*
 — *rectangulata*, L. Generally abundant
Collix sparsata, Hb. *Sandwich*
Lobophora sexalata, Vill. *Eltham, Sidcup*; scarce
 — *hexapterata*, Schiff. *Bexley, Eltham, West Wickham, Sandwich*
 — *viretata*, Hb. *Eltham, Wateringbury, Folkestone, etc.*; scarce
 — *lobulata*, Hb. *Sidcup, Wateringbury, Folkestone*; not common
 — *polycommata*, Hb. Formerly at *Greenhithe, Folkestone*
Thera juniperata, L. *Dover, Wateringbury*; common on the chalk
 — *variata*, Schiff. Generally common
 — *firmata*, Hb. *West Wickham*
Hypsipetes ruberata, Frr. *Dartford*; scarce
 — *impluviata*, Hb. *Bexley, Sidcup, Eltham, West Wickham, Pembury*
 — *elutata*, Hb. Generally abundant
Melanthia rubiginata, Fb. *Lee, Eltham, Deal, Dartford*
 — *ocellata*, L. Generally distributed
 — *albicillata*, L. *Eltham, Bexley, Dartford, Wateringbury, Tenterden, Folkestone*
Melanippe hastata, L. *Dartford, Blean Woods, Tenterden, Folkestone*
 — *procellata*, Fb. Common on the chalk in some places
 — *rivata*, Hb. Common on the chalk
 — *subtristata*, Haw. Generally common
 — *montanata*, Bork. Generally abundant
 — *galiata*, Hb. *Deal, Dover, Folkestone*
 — *fluctuata*, L. Generally abundant
Anticlea rubidata, Fb. *Lee, Eltham, Yalding, Deal, Pembury, Tenterden*
 — *badiata*, Hb. Generally common
 — *derivata*, Bork. *Lee, Eltham, Bromley, Dartford, Wateringbury, Folkestone*
Coremia propugnata, Fb. *Erith, Eltham*, getting scarce; *Wateringbury*, very common; *West Wickham*
 — *ferrugata*, Clerck. Generally common
 — *unidentaria*, Haw. "
 — *quadrifasciaria*, Clerck. *Erith, Bexley, Dartford, Wateringbury, West Wickham*; rare

¹ This is one of the most injurious insects. The larvæ periodically cause immense damage to fruit trees, sometimes completely stripping them of leaves.—H. G.

A HISTORY OF KENT

Camptogramma bilineata, L. Generally abundant
 — *fluviata*, Hb. *Greenhithe, Eltham, Lee, Charlton, West Wickham, Folkestone*
Phibalapteryx tersata, Hb. Common on the chalk
 — *polygrammata*, Bk. Mr. Webb states that a specimen was taken at the mill pond, *Dartford*, in 1874
 — *lignata*, Hb. *Lee, Eltham, Dartford, Folkestone*
 — *vitalbata*, Hb. *Charlton, Plumstead, Dartford, Watlingbury, Folkestone*
Scotosia dubitata, L. *Chislehurst, Lee, Eltham, Folkestone*
 — *vetulata*, Schiff. *Lewisham, Chislehurst*; locally common
 — *rhamnata*, Schiff. *Lewisham, Yalding, Dartford, Folkestone*
 — *certata*, Hb. *Lee, Blackheath, Folkestone*
 — *undulata*, L. *Eltham, Dartford, Seal, Pembury, Tenterden*
Cidaria miata, L. *Lee, Chattenden, Watlingbury, Yalding, West Wickham*; rather scarce
 — *psittacata*, Schiff. *Folkestone*
 — *picata*, Hb. *Sevenoaks, Watlingbury, Dartford, Pembury, Tenterden, Folkestone*
 — *corylata*, Thnb. Generally common
 — *sagittata*, F. Near *Wye*, and one specimen at *Dover* in 1885, according to Mr. Webb
 — *russata*, Bork. Generally common
 — *immanata*, Haw. Generally distributed
 — *suffumata*, Hb. *Lee, Eltham, Watlingbury, Folkestone*
 — *silaceata*, Hb. *Bexley, Dartford, Watlingbury, Yalding, West Wickham, Folkestone*
 — *prunata*, L. *Deal*; often common
 — *testata*, L. Generally common
 — *fulvata*, Forst. " "
 — *pyraliata*, Fb. Generally distributed; formerly abundant
 — *dotata*, L. Generally common in gardens
Pelurga comitata, L. *Lee, Greenwich, Deal, West Wickham, Folkestone*
Eubolia cervinaria, Schiff. *Lee, Eltham, Watlingbury, Yalding, Deal, Folkestone*
 — *mensuraria*, Schiff. Generally common
 — *palumbaria*, Bork. *Deal, Watlingbury, Folkestone, Chattenden, Shoreham, West Wickham*
 — *bipunctaria*, Schiff. Generally abundant on the chalk; also at *Eltham* and *Grove Park*
 — *lineolata*, Hb. *Deal, Sandwich*; abundant
Anaitis plagiata, L. Generally common
Chesias spartiata, Fuess. " "
 — *obliquaria*, Bork. *Eltham, Abbey Wood, Erith, Watlingbury, Folkestone*

Tanagra chæropyllata, L. *Plumstead, Folkestone, West Wickham*

DREPANULIDÆ

Platypteryx lacertula, Schiff. Generally distributed and not scarce
 — *falcula*, Schiff. Generally distributed and not scarce
 — *hamula*, Esp. *Dartford, Lee, Chislehurst, Eltham, Chattenden, West Wickham, Folkestone*
 — *unguicula*, Hb. *Bexley*, scarce; *Watlingbury*, fairly common; *West Wickham*
Cilix spinula, Schiff. Generally common

PSEUDO-BOMBYCES

Dicranura furcula, L. *Lewisham, Greenhithe, Watlingbury, Folkestone*; scarce
 — *bifida*, Hb. *Bexley, Charlton, Greenhithe, Watlingbury, Folkestone*; scarce
 — *vinula*, L. Generally common
Stauropus fagi, L. *Dartford, Bexley, Farnborough, Watlingbury, West Wickham*; scarce
Petasia cassinea, Hb. *Chattenden, Eltham, Yalding, Watlingbury*
Pygæra bucephala, L. Generally abundant
Clostera curtula, L. *Bromley, Bexley, Charlton, Greenhithe, West Wickham*; scarce
 — *anachoreta*, Fb. *Walmer, Folkestone, Deal*; very local
 — *reclusa*, Fb. Common in some places; *Watlingbury*, scarce
Ptilophora plumigera,¹ Esp. *Chattenden, Wrotham*; very rare
Ptilodontis palpina, L. *Lee, Eltham, Bexley, Yalding, Watlingbury, Folkestone*; common
Notodonta camelina, L. Generally distributed and not scarce
 — *cucullina*, Hb.² *Watlingbury*; very scarce
 — *carmelita*, Esp. *Dartford, Chislehurst, West Wickham, Watlingbury*; very scarce
 — *dictæa*, L. *Watlingbury, Yalding, Deal, Eltham, Lee, Greenhithe, West Wickham, Folkestone*

¹ This species is almost confined to Buckinghamshire, but Mr. Farn says he once took the perfect insect at Chattenden, and Mr. Goodwin says he found a larva at Wrotham.—H. G.

² This species is almost confined to the neighbourhood of Halton in Buckinghamshire. With the exception of Mr. Goodwin's record for the neighbourhood of Watlingbury, I have no note of its occurrence in the United Kingdom out of Buckinghamshire; but Mr. G. C. Barrett states it has been taken in several other counties.—H. G.

INSECTS

- Notodonta dictæoides, Esp. *Greenbithe, Dartford, Chislehurst, Wateringbury, West Wickham*; scarce
- dromedarius, L. *Dartford, Bexley, Chislehurst, Yalding, Wateringbury*
- ziczac, L. *Greenbithe, Dartford, Yalding, Wateringbury*; common in some places
- trepida, Esp. *Eltham, Dartford, West Wickham, Yalding, Wateringbury*; scarce
- chaonia, Hb. *Eltham, Lee, Dartford, Folkestone, Wateringbury*; very scarce
- dodonea, Hb. *Eltham, Greenbithe, Yalding, Folkestone*; scarce
- Diloba cæruleocephala, L. *Chattenden, Eltham, Deal, Wateringbury*; often common

NOCTUÆ

- Thyatira derasa, L. *Lee, Eltham, Dartford, Bexley, Wateringbury, Yalding, West Wickham*; scarce
- batis, L. *Lee, Eltham, Folkestone, Dartford, Bexley, Wateringbury, West Wickham*
- Cymatophora duplaris, L. *Deal, Dartford, Eltham, Bexley, Chislehurst, Wateringbury, Folkestone*
- fluctuosa, Hb. *West Wickham, Eltham, Dartford, Wateringbury, uncommon; West Wickham, Folkestone*
- diluta, Fb. Common in many places
- or, Fb. *Bexley, Addington, Dartford, Eltham, Wateringbury, West Wickham, Folkestone*
- flavicornis, L. *West Wickham, Dartford, Chislehurst, Wateringbury, Folkestone*
- ridens,¹ Fb. *West Wickham*
- Bryophila glandifera, Hb. *Deal, Folkestone, West Wickham*
- perla, Fb. Generally abundant
- Dipthera orion,² E. *Folkestone*
- Acronycta tridens, Schiff. *Dartford, Bexley, Lee, Lewisham, Folkestone*
- psi, L. Generally common
- leporina, L. *Eltham, Dartford, Chislehurst, Wateringbury, West Wickham*; scarce
- aceris, L. *Lee, Eltham, Blackheath, Wateringbury, West Wickham, Folkestone*
- megacephala, Fb. Generally common
- ligustri,³ Fb. *Bexley, Eltham, Dartford, Wateringbury*

¹ Colonel Irby records this species from West Wickham. I have no note of its occurrence elsewhere in the county.—H. G.

² Included by Mr. Ulyett in his list of Folkestone Lepidoptera. I have no other records.—H. G.

³ Mr. Goodwin states that a larva of *Acronycta*

- Acronycta rumicis*, L. *Deal, Eltham, Wateringbury*
- auricoma,⁴ Fb. *Blean Woods, Folkestone*
- Leucania conigera, Fb. Generally common
- vitellina, Hb. *Folkestone*; very rare
- lithargyria, Esp. Generally common
- albipuncta,⁵ Fb. *Folkestone*, not common; *Yalding*, one specimen at 'light,' *Deal*
- obsoleta, Hb. *Cliffe, Greenbithe*, etc.
- littoralis, Cart. *Deal*; common
- pudorina, Hb. *Greenbithe, Chislehurst, Sandwich*; common
- comma, L. Generally common in suitable places
- straminea, Tr. *Greenbithe, Cliffe, Deal, Greenwich, Dartford, Folkestone*
- impura, Hb. Generally abundant
- pallens, L.
- phragmitidis, Hb. "*Greenbithe, Cliffe, Deal, Greenwich, Gravesend*
- Tapinistola bondii, Knaggs. *Folkestone*
- Senta ulvæ, Hb. *Cliffe, Gravesend, Greenbithe*, etc.
- despecta, Tr. *Deal*; abundant in some places
- fulva,⁶ Hb. *Greenbithe, Deal*, etc.; abundant in some places
- geminipuncta, Hatch. *Greenbithe, Cliffe, Gravesend, Deal, Folkestone*
- sparganii, Esp. *Hythe, Deal*; very rare
- Nonagria typhæ, Esp. Common in some localities
- lutosa, Hb. *Eltham, Lee, Greenbithe, Wateringbury, Folkestone*
- Gortyna flavago, Esp. Common in some localities
- Hydræcia nictitans, Bork. Generally common; often abundant
- micacea, Esp. *Eltham, Lee, Deal*, etc.; common
- Axylia putris, L. Generally common
- Xylophasia rurea, Fb. " "
- lithoxylea, Fb. " "
- sublustris, Esp. *Deal*; common
- polydon, L. Generally abundant
- hepatica, L. *Bexley, Dartford, Lee, Wateringbury*, etc.; common

alni, L., was once taken near Wateringbury, and Mr. Ulyett includes the species in his Folkestone list.—H. G.

⁴ Mr. Charles Fenn gives Blean Woods as a locality for this species, and Mr. Ulyett includes it in his list of Folkestone Lepidoptera.—H. G.

⁵ Captain Savile Reid records the capture at 'light' of a specimen of this species at Yalding on September 10, 1896.—H. G.

⁶ Mr. Ulyett includes *Nonagria bellmanni*, Evers., in his list of Folkestone species. I am not aware of its occurrence out of the Fen districts of Cambridge and Norfolk.—H. G.

A HISTORY OF KENT

- Xylophasia scolopacina*,¹ Esp. Once at *Lewis-ham*; near *Maidstone*; *Folkestone*, rare
- Dipterygia pinastri*, L. Generally common in the *London* district; *Wateringbury*, uncommon; *West Wickham*
- Xylomiges conspicillaris*, L. Formerly at *Dartford*, *Greenhithe*
- Aporophila australis*, Bdv. *Deal*; abundant
- Laphygma exigua*, Hb. *Lee*, *Greenwich*, *Deal*, etc.; very rare
- Neuria saponaria*, Bork. *Dartford*, *Bexley*, *Wateringbury*, *Folkestone*
- Heliophobus popularis*, Fb. *Eltham*, *Deal*, *West Wickham*, *Folkestone*
- Chareas graminis*, L. *Deal*, *Wateringbury*
- Pachetra leucophæa*,² View. *Wye*, *Westwell*, *Folkestone*; a very local species
- Cerigo cytherea*, Fb. Generally common; *Deal*, abundant
- Luperina testacea*, Hb. Generally abundant
- *cespitis*, Fb. *Chislehurst*, *West Wickham*, *Yalding*, *Folkestone*; not uncommon at 'light'
- Mamestra abjecta*, Hb. *Dartford*, *Greenwich*, *Gravesend*, *Deal*, *Folkestone*
- *anceps*, Hb. Generally common
- *albicolon*, Hb. *Deal*; common
- *brassicæ*, L. Generally abundant
- *persicariæ*, L. Generally common
- Apamea basilinea*, Fb. " "
- *gemina*, Hb. " "
- *unanimis*, Tr. *Eltham*, *Lee*, *Deal*, etc.
- *ophiogramma*, Esp. *Lee*, *Eltham*, *Greenwich*, *Deal*; common in some places, but generally rare
- *fibrosa*, Hb. *Deal*
- *oculea*, Gn. Generally common and often abundant
- Miana strigilis*, Clerck. Generally common and often abundant
- *fasciuncula*, Haw. Generally abundant
- *literosa*, Haw. *Eltham*, *Lee*, *Bexley*, *Dartford*, *Folkestone*
- *furuncula*, Tr. Generally common and often abundant
- *arcuosa*, Haw. *Lee*, *Eltham*, *Chislehurst*, *Dartford*
- Gramesia trilinea*, Bork. Generally common
- Caradrina morpheus*, Hufn. Generally common; often abundant
- *alsines*, Brahm. Generally common; often abundant
- *blanda*, Tr. Generally common; often abundant
- *ambigua*, Fb. *Deal*, and elsewhere
- *cubicularis*, Bork. Generally common
- Rusina tenebrosa*, Hb. *Dartford*, *Bexley*, *Chislehurst*, etc.
- Agrotis valligera*, Hb. *Deal*, abundant; *Folkestone*
- *puta*, Hb. Generally common
- *suffusa*, Hb. " "
- *saucia*, Hb. *Catford*, *Greenhithe*, *Lee*, *Deal*, *Wateringbury*, *Folkestone*
- *segetum*, Schiff. Generally abundant
- *exclamationis*, L. " "
- *corticea*, Hb. Generally common; *Deal*, abundant
- *cinerea*, Hb. *Greenhithe*, *Folkestone*, *Wye*, *Dover*
- *ripæ*, Hb. *Deal*, *Sandwich*; scarce
- *cursoria*, Bork. *Greenhithe*, *Deal*; scarce
- *nigricans*, L. *Greenhithe*, *Deal*, *Greenwich*, *Chislehurst*, etc.; abundant in some places
- *tritici*, L. *Chislehurst*, *Greenwich*, *West Wickham*, *Dover*; abundant at *Deal*
- *aquilina*, Hb. *Eltham*, *Greenwich*, *Folkestone*
- *agathina*, Dap. *Chislehurst*, *West Wickham*, etc.
- *porphyrea*,³ Hb. *Wateringbury*, *Yalding*, and common on heather
- *ravida*, Hb. *Greenhithe*, *Folkestone*
- *lucerneæ*, L. *Sandwich*
- Triphæna ianthina*, Esp. Generally common
- *fimbria*, L. *Erith*, *Dartford*, *Bexley*, *Eltham*, *Chislehurst*, *Wateringbury*, *West Wickham*
- *interjecta*, Hb. *Dover*, *Folkestone*, *West Wickham*, *Eltham*; not generally common
- *comes*, Hb. (*orbona*, Fb.). Generally common
- *pronuba*, L. Generally abundant
- Noctua glareosa*, Esp. *Abbey Wood*, now extinct; *West Wickham*, *Folkestone*
- *augur*, Fb. *Eltham*, *Deal*, *Chislehurst*, *Wateringbury*, etc.; abundant in many places
- *pecta*, L. *Deal*, *Eltham*, *West Wickham*; common in some places
- *c-nigrum*, L. *Deal*, *Dartford*, *Eltham*, *Folkestone*, *West Wickham*
- *ditrapezium*, Bork. *Dartford*; rare
- *triangulum*, Hufn. Generally common
- *rhomboidea*, Tr. *Bexley*, *Abbey Wood*, *West Wickham*
- *brunnea*, Fb. Generally common
- *festiva*, Hb. " "
- *dahlia*, Hb. *West Wickham*, *Wateringbury*, *Yalding*

¹ Mr. Fenn is responsible for this record.—H. G.

² Mr. Ulyett includes this species in his list of *Folkestone* *Lepidoptera*.—H. G.

³ Captain Savile Reid has taken this species at *Yalding*, though he says there is no heather in the neighbourhood.—H. G.

INSECTS

- Noctua rubi*, View. Generally common
 — *umbrosa*, Hb. *Lee, Sandwich*
 — *baja*, Fb. Generally common
 — *neglecta*, Hb. *Chislehurst, Abbey Wood, Watlingbury, West Wickham*; not common
 — *xanthographa*, Fb. Generally abundant
Trachea piniperda, Panz. *Watlingbury, West Wickham, Folkestone*
Tæniocampa gothica, L. *Greenhithe, Watlingbury*; generally common
 — *leucographa*, Hb. *West Wickham, Folkestone*
 — *rubricosa*, Fb. Generally distributed, but getting scarce
 — *instabilis*, Esp. Generally common
 — *populeti*, Fb. *Lee, Eltham, Bexley*; common in some places
 — *stabilis*, View. Generally abundant
 — *gracilis*, Fb. Generally distributed and not scarce
 — *miniosa*, Fb. *Eltham, Chattenden, Yalding*; abundant in some places
 — *munda*, Esp. Generally distributed and common
 — *cruda*, Tr. Generally abundant
Orthosia suspecta, Hb. *Chislehurst*, common; *Folkestone*
 — *ypsilon*, Bork. *Eltham, Greenwich, Abbey Wood Marshes*; common
 — *lota*, Clerck. Generally common
 — *macilenta*, Hb. *Charlton, Sevenoaks, West Wickham, Folkestone*
Anchocelis rufina, L. *Dartford, Bexley, Watlingbury, Folkestone*
 — *pistacina*, Fb. Generally common
 — *lunosa*, Haw. *Eltham, Lee, Watlingbury, Deal, Folkestone*
 — *litura*, L. *Dartford, Bexley, Deal, Watlingbury*; common
Cerastes vaccinii, L. Generally common
 — *spadicea*, Hb. "
 — *erythrocephala*, Fb. *Darent, Wye, Folkestone*; very rare
Scopelosoma satellitia, L. Generally common
Oporina croceago, Fb. *Chislehurst, Eltham, Dartford, Yalding, Watlingbury, Folkestone*
Xanthia citrargo, L. *Lee, Chislehurst, Blackheath, Yalding*
 — *cerago*, Fb. Generally common
 — *silago*, Hb. Generally distributed and not scarce
 — *aurago*, Fb. *Greenhithe, Lee, Sevenoaks*
 — *ocellaris*. *Bexley*; very rare
 — *gilvago*, Esp. *Greenhithe, Dartford, Folkestone*, etc.; rare
 — *ferruginea*, Esp. Generally common
Cirrhædia xerampelina, Hb. *Eltham, Charlton, Folkestone*
Tethea subtusa, Fb. *Lee, Greenhithe, Eltham, Bexley, Watlingbury*
 — *retusa*, L. *Eltham, Yalding, Folkestone*; scarce
Dicycla oo,¹ L. *Hayes, Bexley, Eltham, West Wickham*; rare
Cosmia trapezina, L. Generally abundant
 — *diffinis*, L. *Greenhithe, Abbey Wood, Lee, Bexley, Eltham, Yalding, Watlingbury, West Wickham*
 — *affinis*, L. *Greenhithe, Lee, Chattenden, Eltham, Yalding*
Eremobia ochroleuca, Esp. *Dover, Gravesend, Greenhithe, Deal, Cuxton, Maidstone, Folkestone*; scarce
Dianthæcia carpophaga, Bork. *Erith, Greenhithe, Folkestone*
 — *capsincola*, Hb. Generally common
 — *cucubali*, Fues. *Lewisham, Greenhithe, Yalding, Watlingbury, Folkestone*
 — *albimacula*, Bork. *Folkestone Warren*, common; and near *Dover*
 — *conspersa*, Esp. *Dartford, Greenhithe, Watlingbury, Folkestone*
Hecatera dysodea, Hb. *Dartford, Folkestone*
 — *serena*, Fb. Generally common
Polia flavicincta, Fb. *Greenhithe, Eltham, Erith, Deal, Watlingbury, West Wickham, Folkestone*
Epunda lutulenta, Bork. *Dartford, Deal, Folkestone*
 — *viminalis*, Fb. Generally common
Miselia oxyacanthæ, L. "
Agriopsis aprilina, L. *Dartford, Greenhithe, Watlingbury, Folkestone*
Phlogophora meticulosa, L. Generally common
Euplexia lucipara, L. Generally common
Aplecta herbida,² Hb. *Dartford, Eltham, Watlingbury, Folkestone*
 — *nebulosa*, Hufn. Generally common
 — *tincta*, Brahm. *Chislehurst, Dartford, Watlingbury, West Wickham, Folkestone*
 — *advena*, Fb. Occurs at *Watlingbury, Yalding, Folkestone*
Hadena adusta, E. *West Wickham*
 — *protea*, Bork. *Bexley, Dartford*
 — *dentina*, Esp. Generally common
 — *chenopodii*, Fb. Generally common, sometimes abundant
 — *suasa*, Bork. *Greenwich, Greenhithe, Gravesend, Cliffe*
 — *oleracea*, L. Generally abundant

¹ Colonel Irby informed me that the variety of *oo* known as *renago* occurs at West Wickham.—H. G.

² Mr. Fenn states that *Aplecta occulta*, L., formerly occurred at Lee and Blackheath, and Mr. Ulyett includes it in his list of Folkestone Lepidoptera.—H. G.

A HISTORY OF KENT

Hadena pisi, L. Generally common in the larval state
 — *thalassina*, Rott. Generally common
 — *contigua*, Vell. *Darent*, *Greenhithe*, *Yalding*, *West Wickham*, *Folkestone*
 — *genistæ*, Bork. *Lee*, *Greenwich*, *Dartford*, *Yalding*, *Wateringbury*, *Folkestone*
Xylocampa lithoriza, Bork. Generally common
Calocampa vetusta, Hb. *Dartford*, *Deal*, *Folkestone*
 — *exoleta*, L. *Wateringbury*, *Folkestone*; scarce
Xylina zinckenii, Tr. *Belvedere*; one at *Erith*, one at *Darent*; very rare
 — *semibrunnea*, Haw. *Erith*, *Dartford*, *Hythe*, *Wateringbury*, *Yalding*, *Folkestone*
 — *petrificata*, Fb. *Folkestone*
 — *rhizolitha*, s.v. *West Wickham*
Cucullia verbasci, L. *Dartford*, *Greenhithe*, *Eltham*, *Yalding*, *Wateringbury*, *West Wickham*
 — *scrophulariæ*, Esp. *Dartford*
 — *asteris*, Schiff. *Bexley*, *Eltham*, *Dartford*, *Yalding*, *Wateringbury*, *West Wickham*, *Folkestone*
 — *gnaphalii*,¹ Hb. *Greenhithe*, *Dartford*, *Wilmington*, *Sevenoaks*
 — *chamomillæ*, Schiff. *Lee*, *Eltham*, *Bexley*, *Dartford*; sometimes abundant
 — *umbratica*, L. *Lee*, *Eltham*, *Bexley*, *Dartford*, *Yalding*, *Wateringbury*, *West Wickham*, *Folkestone*
Heliothis marginata, Fb. *Dartford*, *Deal*, *Folkestone*
 — *dipsacæ*,² L. *Folkestone*
 — *peltigera*, Schiff. *Lee*, *Deal*, *Folkestone*
 — *armigera*,³ Hb. *Folkestone*; Mr. Webb says 'common at *Dover* in 1879'
Anarta myrtilli, L. Generally common on heaths
Heliodes arbuti, Fb. Common in many places in meadows
Agrophila sulphuralis,³ L. *Dartford*, formerly; *Folkestone*, *Dover*, *Walmer*, *Shepherdswell*, *Canterbury*

¹ Mr. Goodwin states that he has taken the larvæ of this rare insect very sparingly in the Sevenoaks district.—H. G.

² Mr. Ulyett includes both *H. armigera* and *H. dipsacæ* in his list of *Folkestone* *Lepidoptera*.—H. G.

³ This species is abundant in the Brecksand district of south-west Norfolk and west Suffolk, but casual specimens have been taken in Kent. Mr. Webb says it was formerly called 'the Margate Beauty,' and within the last ten years he has known of the capture of individual specimens at *Walmer*, *Dover*, *Shepherdswell* and *Canterbury*.—H. G.

Acontia luctuosa, Esp. *Lee*, *Dartford*, *Yalding*, *Wateringbury*, *Folkestone*
 — *solaris*, s.v. *Shepherdswell*, *Adisham*
Erastria fuscula, Bork. *Dartford*, *Greenhithe*, *Chattenden*, *West Wickham*, *Folkestone*
Hydrelia unca, Schiff. *Ham Marshes* near *Sandwich*
Brephos parthenias, L. *West Wickham*, *Chislehurst*, *Wateringbury*, *Yalding*, *Folkestone*
Habrostola urticæ, Hb. *Lee*, *Eltham*, *Wateringbury*, *West Wickham*
 — *triplesia*, L. *Lee*, *Eltham*, *Erith*, *West Wickham*
Plusia chryson, E. (*orichalcea*, Hb.). Formerly at *Deal* and *Folkestone*
 — *moneta*,⁴ *Greenhithe*, *Eltham*, *Deal*, *Wateringbury*, *Bexley*, *Yalding*; occurring now nearly everywhere. First taken at *Dover* and doubtless an immigrant from the continent
 — *chrysis*, L. Generally common
 — *festuæ*, L. *Greenwich*, *Deal*, *Folkestone*
 — *iota*, L. *Dartford*, *Eltham*, *Yalding*, *Wateringbury*, *West Wickham*
 — *v-aureum*, Gn. *Dartford*, *Yalding*, *Wateringbury*, *Folkestone*
 — *gamma*, L. Generally abundant
Gonoptera libatrix, L. Generally distributed
Amphipyra pyramidea, L. *Bexley*, *Dartford*, *Chislehurst*, *Wateringbury*, *West Wickham*, *Folkestone*
 — *tragopogonis*, L. Generally common
Mania typica, L. " "
 — *maura*, L. " "
Toxocampa pastinum, Tr. *Gravesend*, *Chattenden*, *Folkestone*
Catocala fraxini, L. Has occurred at *Farnborough* and *Folkestone*; very rare
 — *nupta*,⁵ L. Generally common
 — *sponsa*, L. Mr. Webb states that it has been taken at *Dover*
Ophiodes lunaris,⁶ Schiff. *Folkestone*; Mr. Barrett says it was once taken at *West Wickham*
Euclidia mi, Clerck. Generally common
 — *glyphica*, L. " "
Phytometra ænea, Hb. *Folkestone*, *Wateringbury*, etc.; common in many places

⁴ Captain Savile Reid records the capture of two specimens at dusk in 1896 and one at 'light' in 1901.—H. G.

⁵ Mr. Ulyett includes *Catocala promissa* in his list of *Folkestone* *Lepidoptera*. I have no other record of the occurrence of this species in the county.—H. G.

⁶ Inserted on the authority of Mr. Ulyett's list.—H. G.

INSECTS

DELTOIDES

- Madopa salicalis*, Schiff. *Shooters Hill, West Wickham, Tenderden*, formerly near *Bexley*
Hypena proboscidalis, L. Generally common
 — *rostralis*, L. *Greenhithe, Yalding, Tenderden*; not uncommon
 — *crassalis*, Fb. *Sevenoaks, Seal*, etc.
Hypenodes albigstrigalis, Haw. *Greenhithe, Chislehurst, Tenderden, Folkestone*
 — *costæstrigalis*, St. *Chislehurst, Pembury, Folkestone*
Rivula sericealis, Scop. *Bexley, Greenhithe, Lee, Yalding, Tenderden, Deal, Folkestone, Sevenoaks*
Herminia derivalis, Hb. *Tenderden* near *Canterbury, Folkestone*
 — *barbalis*, Clerck. *Dartford, Greenhithe, Chattenden, Tenderden*; very common in some places
 — *tarsipennalis*, Tr. Generally abundant
 — *grisealis*, Hb. Generally common
 — *cribralis*, Hb. *Greenhithe, Dartford, Deal*
Aventia flexula, Schiff. *Sevenoaks*

PYRALIDES

- Odontia dentalis*, Schiff. *Deal, Dover, Folkestone*
Pyalis fimbrialis, Schiff. Generally common
 — *farinalis*, L.
 — *glaucinalis*, L. *Greenhithe, Lee, Eltham, Deal, Tenderden, Folkestone*
Aglossa pinguinalis, L. Generally common
Cledeobia angustalis, Schiff. *Deal, Shoreham, Folkestone*, etc.
Pyrausta punicealis, Schiff. Common on the downs everywhere
 — *purpuralis*, L. Common on the downs everywhere
 — *ostrinalis*, Hb. Common on the downs everywhere
Herbula cespitalis, Schiff. Common on the downs everywhere
Ennychia anguinalis, Hb. Common on the chalk downs
 — *cingulalis*, Schiff. Chalk downs
 — *octomaculalis*, Fb. *Blean Woods, Folkestone, Darent* formerly
Agrotera nemoralis,¹ Scop. Near *Sturry* commonly, and formerly near *Folkestone*
Endotricha flammealis, Schiff. Generally common

¹ Mr. Farn refers to this as a Kentish species. I do not know of any localities, but Dr. H. G. Knaggs informs me that this species has occurred commonly near *Sturry*. Mr. Ulyett includes it in his list of *Folkestone* *Lepidoptera*.—H. G.

- Cataclysta lemnalis*, Schiff. Generally common
Paraponyx stratiotalis, Schiff. *Greenhithe, Yalding, Gravesend, Lee*
Hydrocampa nymphæalis, Schiff. Generally common
 — *stagnalis*, Gn. *Greenhithe, Deal, Lee*; common
Botys pandalis, Hb. *Dartford, Yalding, Pembury, Folkestone*
 — *flavalis*, Schiff. *Folkestone*
 — *hyalinalis*, Hb. *Deal, Greenhithe, Sevenoaks, Folkestone*
 — *verticalis*, Schiff. Generally common, often abundant
 — *lancealis*, Schiff. *Greenhithe, Abbey Wood, Eltham, Tenderden, Folkestone*
 — *fuscalis*, Schiff. *Greenhithe, Dartford, Chattenden, Folkestone*
 — *urticalis*, Schiff. Generally common
Ebulea crocealis, Hb. *Greenhithe, Deal, Bexley, Dartford, Folkestone*
 — *verbascalis*, Schiff. *Greenhithe, Chatham, Bexley, Erith, Chattenden*; often abundant
 — *sambucalis*, Schiff. Generally common
 — *stachydalis*, Zinz. *Greenhithe, Yalding, Chattenden, Dover*
Pionea forficatalis, L. Generally common
 — *stramentalis*, Hb. *Greenhithe, Otford, Shoreham, Yalding, Sevenoaks, Watlington, Folkestone*
Spilodes sticticalis, L. *Deal, Pembury, Folkestone*; rare
 — *palcalis*, Schiff. *Greenhithe, Maidstone, Deal, Dover, Folkestone*; rare
 — *cinctalis*, Tr. *Greenhithe, Dartford, Folkestone*
Scopula lutealis, Hb. *Greenhithe, Dartford, Deal*
 — *olivalis*, Schiff. Generally common
 — *prunalis*, Schiff. " "
 — *ferrugalis*, Hb. Generally distributed
Lemodes pulveralis, Hb. *Folkestone*; Mr. Webb states that it has not been taken for ten years or more
Stenopteryx hybridalis, Hb. Generally common
Margarodes unionalis, Hb. Near *Dover*
Diasemia ramburialis, Dup. *Folkestone, St. Margaret's, Ashford*
Scoparia ambigua, Tr. Generally common
 — *basistrigalis*, Knaggs. *Dartford, Bexley*
 — *cembræ*, Haw. Generally distributed
 — *dubitalis*, Hb. Generally common
 — *ingratella*, Zell. *St. Margaret's Bay, Folkestone*
 — *lineola*, Curt. *Deal, Folkestone*
 — *mercurella*, L. Generally common
 — *cratægella*, Hb. *Bexley, Folkestone*

A HISTORY OF KENT

- Scoparia truncicolella*, Sta. *Greenhithe, Chislehurst*; common
 — *angustea*, St. *Greenhithe, Deal, Bexley, Folkestone*
 — *pallida*, St. *Greenhithe, Deal, Folkestone*

CRAMBITES

- Platytes cerussellus*, Schiff. *Greenhithe, Deal, Folkestone, Sevenoaks*; often abundant
 — *alpinellus*, Hb. *Deal*
Crambus falsellus, Schiff. *Lee, Greenhithe, Yalding, Eltham, Deal, Dartford, Folkestone*
 — *pratellus*, L. Generally common, often abundant
 — *dumetellus*, Hb. *Folkestone*
 — *pascuellus*, L. Generally abundant
 — *uliginosellus*, Zell. *Sandwich, Pembury, Tenterden*; common
 — *pinetellus*, L. *Greenhithe, Dartford, Eltham, Lee, Chislehurst, Yalding, Folkestone*
 — *perlellus*, Scop. Generally common
 var. *warringtonellus*, Zell. *Folkestone*
 — *tristellus*, Fb. Generally abundant
 — *contaminellus*, Hb. *Deal*, common; *Blackheath*
 — *geniculellus*, Haw. *Greenhithe, Deal, Dartford, Folkestone*
 — *culmellus*, L. Generally common, often abundant
 — *chrysonuchellus*, Scop. *Greenhithe, Deal, Bexley, Dartford*
 — *hortuellus*, Hb. Generally common
Chilo phragmitellus, Hb. *Greenhithe, Greenwich, Cliffe, Deal, Gravesend, Folkestone*
 — *mucronellus*, Schiff. *Deal, Cliffe*
Schænobius forficellus, Thub. *Greenhithe, Deal, Eltham, Folkestone*
Anerasia lotella, Hb. *Deal*; common
Illythia carnella, L. *Greenhithe, Shoreham, Folkestone*

- Myelophila crirella*, Hb. *Greenhithe, Lee, Dartford, Eltham*
Homosoma sinuella, Fb. *Greenhithe, Deal*; common
 — *nimbella*, Zell. *Greenhithe, Folkestone*
 — *binævella*, Hb. *Dartford, Bexley, Deal, Greenhithe, Folkestone*
Nyctegretes achatinella, Hb. *Deal*
Ephestia elutella, Hb. *Lee, Dartford, Bexley*
 — *semirufa*, St. *Lewisham*
 — *pinguis*, Haw. *Eltham, Folkestone*
 — *formosella*, Haw. *Lewisham*
Crypoblabes bistriga, Haw. *Eltham, Dartford, Folkestone*
Gymnanclya canella, Hb. *Minster*
Nephopteryx angustella, Hb. *Deal, Shoreham*
Phycis betulella, Göze. *Chislehurst, Chattenden, Bexley, etc.*
 — *carbonaella*, Fisch. *Chislehurst, etc., etc.*
 — *dilutella*, Hb. Common on the chalk downs
 — *ornatella*, Schiff. Common on the chalk downs near the sea
 — *roborella*, Zinck. *Darentb, Bexley, Folkestone*
Pempelia palumbella, Fb. *Shoreham, Folkestone*
Rhodophea consociella, Hb. Generally common excepting near the sea
 — *advenella*, Zinck. *Lee, Eltham, Folkestone*
 — *suavella*, Zinck. *Dartford, Eltham, Folkestone*
 — *tumidella*, Zinck. *Dartford, Bexley, Chattenden, Folkestone*
 — *rubrotibiella*, Fisch. *Lewisham, Folkestone*
Oncocera ahenella, Zinck. *Deal, Shoreham, Folkestone*
Melia sociella, L. Generally common
 — *anella*, Gn. *Deal, Folkestone*. Mr. Webb says it has not been seen for years
Galleria cerella, L. *Dover, Folkestone*
Melephora alveariella, Gn. „ „

MICRO-LEPIDOPTERA

TORTRICES

- Halias prasinana*, L. *Chislehurst, Seal, Chattenden, etc.*
 — *quercana*, Schiff. *Dartford, Sevenoaks, etc.*
 — *chlorana*, L. *Lee, etc.*
Sarrothripa revayana, Tr. *Eltham, West Wickham, Lewisham*
Tortrix podana, Scop. Generally distributed
 — *cratægana*, Hb. *Chislehurst, Gravesend, Sevenoaks, Folkestone, etc.*
 — *xylostean*a, L. Generally distributed
 — *sorbiana*, Hb. Widely distributed
 — *rosana*, L. Generally distributed

- Tortrix diversana*, Hb. *Lee, Chislehurst, Chattenden, Greenhithe, etc.*
 — *cinnamomeana*, Tr. *Dover, Seal, Darentb*
 — *heparana*, Schiff. Generally distributed
 — *ribeana*, Hb. „ „
 — *corylana*, Fb. „ „
 — *unifasciana*, Dup. „ „
 — *semialbana*, Gn. *Darentb, Greenhithe, Folkestone*
 — *costana*, Fb. *Greenwich, Lee, Eltham, etc.*
 — *viburnana*, Fb. *Tunbridge Wells, etc.*
 — *palleana*, Hb. *Folkestone, etc.*
 — *viridana*, L. Generally distributed
 — *ministrana*, L. „ „

INSECTS

Tortrix forsterana, Fb. Generally distributed
Dichelia grotiana, Fb. *Eltbam, Chattenden, Dartford*, etc.
Leptogramma literana, L. *West Wickham, Bexley, Folkestone*, etc.
 — *scabrana*, Fb. *Sevenoaks, Darent, Tunbridge Wells*, etc.
Peronea sponsana, Fb. Generally distributed
 — *rufana*, Schiff. *Dover, Birch Wood*
 — *schalleriana*, L. Generally distributed
 — *comparana*, Hb. " "
 — *variegana*, Schiff. " "
 — *cristana*, Fb. *Folkestone, Darent, West Wickham*, etc.
 — *hastiana*, L. Generally distributed
 — *ferrugana*, Tr. " "
 — *logiana*, Schiff. " "
 — *aspersana*, Hb. Most chalk downs
Rhacodia caudana, Fb. Generally distributed
Teras contamina, Hb. " "
Dictyopteryx loeflingiana, L. " "
 — *holmiana*, L. " "
 — *bergmanniana*, L. " "
 — *forskaleana*, L. " "
Argyrotoza conwayana, Fb. " "
Ptycholoma lecheana, L. " "

PENTHINIDÆ

Diluta hartmanniana, L. *Mottingham, Gravesend, Eltham*, etc.
 — *semifasciana*, Haw. Widely distributed
Penthina corticana, Hb. Generally distributed
 — *betulætana*, Haw., St. Generally distributed
 — *capræana*, Hb. *Darent, Tunbridge Wells, Eltham, West Wickham, Seal, Chislehurst*, etc.
 — *sororculana*, Zett. Generally distributed
 — *pruniana*, Hb. " "
 — *ochroleucana*, Hb. " "
 — *variegana*, Hb. " "
 — *sauciana*, Hb. *Tunbridge Wells, Seal*, etc.
 — *gentiana*, Hb. Generally distributed
 — *sellana*, Hb. " "
 — *marginana*, Haw. *Tunbridge Wells, Chattenden, Dover, Folkestone, Greenhithe*, etc.
 — *fuligana*, Hb. *Folkestone, Lee, Chattenden, Eltham*, etc.
Antithesia salicella, L. Generally distributed

SPILONOTIDÆ

Hedya ocellana, Fb. Generally distributed
 — *laricina*, Zell. " "
 — *pauperana*, Dup., Frr. *Darent*
 — *aceriana*, Dup. Generally distributed
 — *dealbana*, Fröl. " "
 — *neglectana*, Dup. " "
 — *servillana*, Dup. *Darent, Chattenden, Eltham*, etc.

Hedya simplana, Fisch. *Darent*
Spilonota incarnatana, Hb. *Bexley*
 — *trimaculana*, Haw. Generally distributed
 — *rosæcolana*, Dbl. " "
 — *roborana*, Tr. " "
Pardia tripunctana, Fb. " "

SERICORIDÆ, Gn.

Aspis udmanniana, L. Generally distributed
Sideria achatana, Fb. " "
Sericoris euphorbiana,¹ Frr. *Folkestone, Shoreham*
 — *bifasciana*, Haw., St. *Chislehurst, Bexley, West Wickham*, etc.
 — *littoralis*, Curt. *Gravesend, Hythe*, etc.
 — *fuligiana*, Haw. (non Hb.) D.L. *Folkestone, Gravesend*
 — *cespitana*, Hb. Generally on chalk downs
 — *rivulana*, Scop. Generally distributed
 — *urticana*, Hb. " "
 — *lacunana*, Dup. " "
Roxana arcuana, Clerck, L. *Darent, Greenhithe*, etc.
Euchromia purpurana, Haw. *Shoreham, Chattenden*, etc.
Orthotænia antiquana, Hb. Generally distributed
 — *striana*, Schiff. Generally distributed
 — *branderiana*, L. *Bexley, Eltham, Folkestone, Darent*, etc.
 — *ericetana*, Westw. *Chislehurst*, etc.

SCIAPHILIDÆ, Gn.

Eriopsela fractifasciana, Haw. Generally on chalk downs
 — *quadrana*, Hb. *West Wickham, Dover, Folkestone, Darent*, etc.
Phtheocroa rugosana, Hb. Generally distributed
Cnephasia cinctana, Schiff. Near *Dover* and near *Canterbury*
 — *musculana*, Hb. Generally distributed
Sciaphila nubilana, Hb. " "
 — *conspersana*, Dougl. *Folkestone*, etc.
 — *subjectana*, Gn., St. Generally distributed
 — *virgaureana*, Tr. " "
 — *pascuana*, Hb. " "
 — *chrysanthæana*, Dup. " "
 — *sinuana*, St. *Chislehurst, Sidcup*
 — *hybridana*, Hb. Generally distributed
Sphaleroptera ictericana, Haw. Generally distributed
Capua favillaceana, Hb. Generally distributed

GRAPHOLITHIDÆ

Bactra lanceolana, Hb. Generally distributed

¹ Mr. Sydney Webb says that this species (*euphorbiana*) occurs sparingly in some woods, but is extinct at Folkestone.—H. G.

A HISTORY OF KENT

- Bactra furfurana*, Haw. *Folkestone*; now almost extinct
- Phoxopteryx siculana*, Hb. *West Wickham*, *Darenth*, etc.
- *uncana*, Hb. *Chislehurst*, *Bexley*, *Seal*, *Tunbridge Wells*, etc.
- *biarcuana*, St. *Darenth*, *Tunbridge Wells*, etc.
- *inornatana*, H.S. *Darenth*, *Tunbridge Wells*, etc.
- *comptana*, Fröl. Generally on chalk downs
- *myrtillana*, Tr. *Sevenoaks*
- *lundana*, Fb. Generally distributed
- *derasana*, Hb. " "
- *diminutana*, Haw. *Chattenden*, *Eltham*, *Folkestone*, *Greenhithe*, etc.
- *mitterbacheriana*. Generally distributed
- *upupana*, Tr., H.S. *West Wickham*, *Chislehurst*, *Eltham*, *Darenth*, etc.
- *lactana*, Fb. Generally distributed
- Grapholitha ramella*, L. " "
- *nisella*, Clerck. " "
- *cinerana*, Haw. *Bexley*, *Folkestone*, *Darenth*
- *nigromaculana*, Haw. Generally distributed
- *subocellana*, Don. Generally distributed
- *minutana*, Hb. *Lee*, *Bexley*, *Blackheath*, *Eltham*, etc.
- *trimaculana*, Don., Wilk. Generally distributed
- *penkleriana*, Fisch. Generally distributed
- *obtusana*, Haw. *Folkestone*, *Chattenden*, *Darenth*, *Eltham*, *Tunbridge Wells*, etc.
- *nævana*, Hb. Generally distributed
- *geminana*, St. *Seal*
- *cæcana*, Schl. Between *Deal* and *Dover*; now apparently extinct according to Mr. Webb.—H. G.
- Phlæodes tetraquetra*, Haw. Generally distributed
- *immundana*, Fisch. Generally distributed
- *demarniana*, Fisch. *Chislehurst*, *Darenth*, *Bexley*, *Swanscombe*, etc.
- Hypermecia angustana*, Hb. Generally distributed
- Batodes angustiorana*, Haw. Generally distributed
- Pædisca bilunana*, Haw. Generally distributed
- *oppressana*, Tr. *Eltham*, *Folkestone*, *Lee*, etc.
- *ratzeburghiana*. *Seal*, *Stone*
- *rubiginosana*, H.S. *Chislehurst*, *Seal*
- *corticana*, Hb. Generally distributed
- *profundana*, Fb., Wilk. Generally distributed
- *ophthalmicana*, Hb. *Bexley*, *Folkestone*, *Eltham*
- *occultana*, Dougl. *Chislehurst*, *Bexley*
- *solandriana*, L. Generally distributed
- *semifuscana*, St. " "
- Ephippiphora similana*, Hb. Generally distributed
- *cirsiana*, Zell. *Chattenden*, *Forest Hill*, *West Wickham*, *Bexley*, etc.
- *pflugiana*, Haw. Generally distributed
- *brunnichiana*, Fröl. " "
- *inopiana*, Haw. *Chattenden*, *Folkestone*, *Darenth*, *Dover*
- *foenella*, L., Wilk. *Dartford*, *Bexley*, *Eltham*, etc.
- *nigricostana*, Haw. Generally distributed
- *signatana*, Dougl. *Folkestone*, *Dover*, *Chattenden*
- *trigeminana*, St. Generally distributed
- *tetragonana*, St. *Chattenden*, *Stone*, *Folkestone*
- *populana*, Fb. *Chislehurst*, *Folkestone*, *Darenth*, *Eltham*
- *obscurana*, St. *West Wickham*, *Eltham*, *Bexley*, *Chattenden*, *Darenth*
- Olindia ulmana*, Hb. *Seal*, *Folkestone*
- Semasia spiniana*, Fisch., Dup. *Lee*, *West Wickham*, *Darenth*, etc.
- *ianthinana*, Dup. Generally distributed
- *rufillana*, Wilk., Zell. " "
- *wœberiana*, Schiff. " "
- Coccyx splendidulana*, Gn. Generally distributed
- *argyrana*, Hb. Generally distributed
- *tædella*, Clerck, L. " "
- *nanana*, Tr. *Bexley*, *Sevenoaks*
- Heusimene fimbriana*, Haw. *West Wickham*, *Chislehurst*, etc.
- Retinia buoliana*, Schiff. Generally distributed
- *pinicolana*, Dbl. *Tunbridge Wells*, *Bexley*, *West Wickham*, etc.
- *turionana*, Hb. *West Wickham*, *Tunbridge Wells*, *Sevenoaks*
- *pinivorana*, Zell. Generally distributed
- *sylvestrana*, Curt., Wilk. *Bexley*, *West Wickham*
- Carpocapsa splendidana*, Hb. Generally distributed
- *grossana*, Haw. *Bexley*
- *pomonella*, L. Generally distributed
- Opadia funebrana*, Tr. In most gardens and plum orchards
- Endopisa nigricana*, St. Generally distributed
- Stigmonota*, Gn.; *ravulana*, H.S. *Folkestone*
- *coniferana*, Ratzb. *Bexley*, *Chislehurst*
- *leplastrierana*, Curt. *Deal*, *Folkestone*, *Dover*, etc.
- *perlepidana*, Haw. *Chattenden*, *Darenth*, *Folkestone*
- *internana*, Gn. *Blackheath*, *Chislehurst*, *Tunbridge Wells*, etc.
- *compositella*, Fb. Generally distributed
- *nitidana*, Fb., Wilk. " "
- *trauniana*, Schiff. *Darenth*, *Plumstead*, *Bexley*

INSECTS

- Stigmonota regiana*, Zell. Generally distributed
 — *roseticolana*, Zell.
 — *germarana*, Hb. *Eltham, Chattenden, West Wickham*, etc.
Dicroramphia politana, Hb. *Lee, Chattenden, Mottingham*, etc.
 — *alpinana*, Tr. *Eltham, Stone, Chattenden*, etc.
 — *sequana*, Hb. *Lee, Folkestone, Darent*, *Bexley*
 — *petiverella*, L. Generally distributed
 — *plumbana*, Scop. " "
 — *plumbagana*, Tr. " "
 — *acuminatana*, Zell. *Cuxton, Lee, Shoreham, Folkestone*, etc.
 — *simpliciana*, Haw. *Dover, Bexley, Eltham, Dartford*, etc.
 — *consortana*, S. *Charlton, Shoreham, Folkestone*, etc.
Pyrodes rheediella, Clerck, L. Generally distributed
Catoptria albersana, Hb. Generally distributed
 — *ulicetana*, Haw. Generally distributed
 — *juliana*, Curt. *Lee, Bexley, Eltham*, etc.
 — *microgrammana*, Gn. *Dover, Folkestone, Walmer*
 — *hypericana*, Hb. Generally distributed
 — *cana*, Haw., St., Wd. Generally distributed
 — *fulvana*, St., Wilk. *Folkestone, Dover*, etc.
 — *candidulana*, Nolck. *Gravesend, Greenhithe*, etc.
 — *scopoliana*, Haw., St., Wd. Generally distributed
 — *cæcimaculana*, Hb. *Darent*, etc.
 — *conterminana*, H.S. *Dartford, Folkestone*
 — *æmulana*, Schil. *Darent, Plumstead, Swanscombe*
 — *tripoliana*, Bar. *Gravesend*
 — *expallidana*, Haw. *Dover, Stone, Folkestone, Shoreham*
 — *citrana*, Hb. *Folkestone*
 — *pupillana*, Clerck, L. *Folkestone*
Trycheris aurana, Fb. *Chattenden, Eltham, St. Mary Cray, Greenhithe, Folkestone*

PYRALOIDIDÆ, Gn.

- Choreutes bjerkandrella*, Thnb. *Folkestone*
 — *myllerana*, Fb. Fairly distributed
Symæthis pariana, Clerck, L. Generally distributed
 — *oxyacanthella*, L. Generally distributed

CONCHYLIDÆ, Gn.

- Eupoecilia nana*, Haw. Generally distributed
 — *dubitana*, Hb.
 — *atricapitana*, St. *Charlton, Bexley, Folkestone, Dover, Shoreham*

- Eupoecilia maculosana*, Haw. Generally distributed
 — *amandana*, H.S. *Darent, Folkestone, Cuxton*, etc.
 — *hybridella*, Hb. *Shoreham, Chattenden*, etc.
 — *ambiguella*, Hb. *West Wickham*
 — *angustana*, Hb. Generally distributed
 — *curvistrigana*, Wilk. *Dover, Bexley, Deal*, near *Gravesend*, etc.
 — *affinitana*, Dougl. *Gravesend*
 — *vectisana*, Westw.
 — *mussehiana*, Tr. *Deal*
 — *udana*, Gn. *Deal*
 — *notulana*, Zell. *Folkestone*
 — *rupicola*, Curt. *Dover, Deal*
 — *flavicillana*, Dbl. *Deal, Shoreham, Folkestone*
 — *roseana*, Haw. Generally distributed
 — *subroseana*, Haw. *Deal*, near *Dartford, Dover*
 — *implicitana*, H.S. *Eltham, Darent, Lee, Chattenden, Plumstead*
 — *sabulicola*, Wlsm. *Cuxton, Shoreham*
Xanthosetia zœgana, L. Generally distributed
 — *hamana*, L. " "
Chrosis alcella, Schulz. " "
 — *bifasciana*, Hb. *Chattenden, Tunbridge, Darent, Swanscombe*
Lobesia reliquana, Hb. Generally distributed
Argyrolepis subbaumanniana, Wilk. *Folkestone, Cuxton, Stone, Shoreham, Dover*, etc.
 — *zephyrana*, Tr. *Lee, Dover, Shoreham, Tunbridge Wells*, etc.
 — *maritimana*, Gn. *Deal*
 — *badiana*, Hb. Generally distributed
 — *cnicana*, Dbl. " "
 — *æneana*, Hb., Haw. *Chattenden, Folkestone*
Conchylis dipoltella, Hb. *Folkestone, Charlton*
 — *francillana*, Fb. Generally distributed
 — *dilucidana*, St. " "
 — *smeathmaniana*, Fb. *Lee, Darent, Eltham, Stone, Dover*, etc.
 — *straminea*, Haw. Generally distributed
 — *alternana*, St. *Folkestone, Deal, Dover*

APHELIIDÆ, Gn.

- Aphelia osseana*, Scop. Generally distributed
Tortricodes hyemana, Hb. " "

TINÆE

EPIGRAPHIIDÆ, Gn.

- Lemnatophila phryganella*, Hb., Sta. Generally distributed
Exapate congelatella, Clerck. *Eltham*
Diurnea fagella, Fb., Sta. Generally distributed
Semioscopus avellanella, Hb. Generally distributed
Epigraphia steinkellneriana. *Bexley*

A HISTORY OF KENT

PSYCHIDÆ, Brd.

- Talæporia pseudo-bombycella*, Hb. Generally distributed
Epichnopteryx pulla, Esp. *Chattenden, Dover, Cuxton*, etc.
 — *reticella*, Newm., Brd. *Gravesend, Sheerness*
Fumea crassiorella, Brd. *Deal*
 — *casta*, Pall. Generally distributed
Solenobia inconspicuellæ, Sta. *Bexley, Pembury, Plumstead, Beckenham*, etc.
 — *douglasi*, Sta. (præc. var. ?). *Birch Wood*
Luffia ferchaullella, St. *Deal, Lewisham, Darent*

TINEIDÆ, Sta.

- Diplodoma marginepunctella*, St. *Bexley, Pembury, Alkham, Darent, Plumstead*
Xysmatodoma melanella, Haw. *Lee, Chislehurst, Bexley*, etc.
Ochsenheimeria birdella, Curt., Sta. *Lee, Lewisham, Bexley*
 — *bisontella*, Zell, Sta. *Dartford Heath*
 — *vaculella*, Fisch, Sta. *Lee, Lewisham, Shooters Hill, Mottingham*
Scardia boleti, Fb., Sta. *Bexley*
 — *corticella*, Curt., Sta. *Lee, Blackheath, Bexley*, etc.
 — *parasitella*, Hb., Sta. *West Wickham, Chislehurst, Eltham*, etc.
 — *granella*, L., Sta. Generally distributed
 — *cloacella*, Haw., St. " "
 — *ruricolella*, Sta. *Swanscombe*
 — *arcella*, Fb., Sta. *Bexley, Lee, Chislehurst, Greenhithe*, etc.
Blabophanes ferruginella, Hb., Sta. Generally distributed
 — *rusticella*, Hb., Sta. Generally distributed
Tinea tapetzella, L., St., Sta. Generally distributed
 — *albipunctella*, Haw. *Dartford Heath*
 — *caprimulgella*, H.S. *Blackheath*
 — *angustipennis*, H.S., Hein.
 — *misella*, Zell., Sta. Generally distributed
 — *pellionella*, L., Sta. " "
 — *pallescentella*, *Dover*
 — *fuscipunctella*, Haw., Sta. Generally distributed
 — *argentimaculella*, Sta. *Blackheath, Sidcup, Eltham*
 — *lapella*, Hb., Sta. Generally distributed
 — *simplicella*, H.S., Sta. *Deal, Dover*, etc.
 — *nigripunctella*, Haw. *Folkestone*
 — *semifulvella*, Haw. Generally distributed
Phylloporia bistrigella, Haw., Sta. *Pembury, Eltham, Bexley*
Tineola biselliella, Hml., Zell. Generally distributed

- Lampronia quadripunctella*, Fb. *Lee, Bexley, Alkham, Pembury*, etc.
 — *luzella*, Hb., St., Sta. *Tenterden, Eltham, Bexley, Chattenden*, etc.
 — *prælatella*, Schiff., Sta. *Bexley, Pembury*
 — *rubiella*, Bjerk., Sta. Generally distributed
Incurvaria muscalella, Fb., Sta. Generally distributed
 — *pectinea*, Haw., Sta. Generally distributed
 — *tenuicornis*, Sta., Hein. *Chislehurst*
 — *œhlmanniella*, Hb. Generally distributed
 — *capitella*, Clerck, Sta. " "
Micropteryx cathella, L., Sta. Generally distributed
 — *aruncella*, Scop. *Pembury, Tenterden, Darent, near Penge*
 — *seppella*, Fb. Generally distributed
 — *mansuetella*, Zell., Sta. *West Wickham, Pembury*
 — *aureatella*, Scop. *Chislehurst, Pembury*
 — *thunbergella*, Fb., Sta. Generally distributed
 — *purpurella*, Haw., St. " "
 — *semipurpurella*, St., Sta. " "
 — *unimaculella*, Zett., Sta. " "
 — *sangii*, Wood. *Bexley, Chislehurst*
 — *sparmanella*, Bosc., Sta. *Chislehurst, Bexley, Eltham, Pembury*
 — *subpurpurella*, Haw. Generally distributed
Nemophora swammerdammella, L. Generally distributed
 — *schwarzella*, Zell., Sta. Generally distributed

ADELIDÆ

- Adela fibulella*, Fb., Sta. Generally distributed
 — *rufimitrella*, Scop., Sta. Generally distributed
 — *croesella*, Scop. *Alkham, Farningham*
 — *degeerella*, L., Sta. Generally distributed
 — *viridella*, L., Scop., Sta. " "
Nematois cupriacellus, Hb., Sta. *Pembury*
 — *fasciellus*, Fb., St. *Darent, Gravesend, Greenhithe*
 — *minimellus*, Zell., Sta. *Pembury*

HYPONOMEUTIDÆ, St.

- Swammerdamia combinella*, Hb. *Eltham, Pembury, Alkham, Tenterden*
 — *cæsiella*, Hb. Generally distributed
 — *oxyacanthella*, Dup. " "
 — *pyrella*, Vill., Sta. " "
 — *spiniella*, Hb., Zell. *Chattenden, Lee*, etc.
Scythropia cratægella, L., St., Sta. *Bexley, Pembury, Chattenden, Lewisham*
Hyponomeuta vigintipunctatus, Retz. *Beckenham*

INSECTS

Hyponomeuta plumbellus, Schiff., Sta. Generally distributed
 — padellus, L., Sta. Generally distributed
 — cagnagellus, Hb. " "
 Anesychia bipunctella, Fb., Sta. Dover
 — decemguttella, Hb. Sta. Darentb, Folkestone
 — funerella, Dover
 Prays curtisellus, Don. Generally distributed

PLUTELLIDÆ, Sta.

Eidophasia messingiella, Fisch. Eltham, Dartford, Pembury
 Plutella maculipennis, Curt. Generally distributed
 — porrectella, L., Sta. Lee, Lewisham, Alkham, etc.
 Cerostoma sequella, Clerck, L., Sta. Shoreham
 — vittella, L., Sta. Generally distributed
 — radiatella, Don., Sta. " "
 — costella, Fb., Sta. " "
 — sylvella, L., Sta. Chislehurst, Bexley, Eltham, Pembury, etc.
 — alpella, Schiff., Sta. Lewisham, Pembury
 — lucella, Fb., Sta. Lee, etc.
 Harpieryx scabrella, L., St., Sta. Beckenham, Bromley, Chislehurst, Eltham, Bexley
 — nemorella, L., St., Sta. Bexley, etc.
 — xylostella, L., Sta. Generally distributed
 Theristis mucronella, Scop. Eltham, Bexley, Darentb, Swanley

GELECHIIDÆ, Sta.

Orthotelia sparganella, Thnb., Sta. Lee, etc.
 Henicostoma lobella, Schiff., Sta. Stone, Kidbrooke, Lee, etc.
 Phibalocera quercana, Fb., Sta. Generally distributed
 Depressaria costosa, Haw., Sta. Generally distributed
 — flavella, Hb. Dover, Lee, Bexley, Eltham, etc.
 — pallorella, Zell., Sta. Dover
 — assimilella, Tr., Sta. Lee, Bexley, Chattenden, Tenderden, etc.
 — nanatella, Sta., Zell. Dover, Birch Wood, Shoreham, Charlton, etc.
 — scopariella, Hein. Lee, etc.
 — atomella, Hb. Charlton, etc.
 — arenella, Schiff., Sta. Generally distributed
 — propinquella, Tr., Sta. Generally distributed
 — subpropinquella, Sta. Folkestone, Darentb, Falkham, Swanley
 — rhodochrella, H.S. Folkestone, Darentb
 — alstroemeriana, Clerck. Generally distributed

Depressaria purpurea, Haw., Sta. Alkham, Darentb, Falkham, Green Street Green, Swanley, Tenderden
 — liturella, Hb. Lee, Lewisham, West Wickham
 — conterminella, Zell., Sta. Generally distributed
 — angelicella, Hb., Sta. Tenderden
 — carduella, Hb., Sta. Bexley, Pembury, Dartford Heath
 — ocellana, Fb., Sta. Eltham, Bexley
 — applana, Fb., Haw., Sta. Generally distributed
 — zephyrella, Hb. Deal
 — rotundella, Dougl., Sta. Folkestone, Shoreham
 — depressella, Hb., Sta. Folkestone
 — discipunctella, H.S. " "
 — douglasella, Sta. Folkestone, Darentb
 — weirella, Sta. Eltham, Lewisham
 — chærophylli, Zell. Generally distributed
 — ultimella, Sta. Folkestone
 — nervosa, Haw., Sta. Alkham
 — badiella, Hb., Sta. Dartford Heath, near Foot's Cray
 — heracleana, De Geer. Generally distributed
 Psoricoptera gibbosella, Zell. Chislehurst
 Gelechia vilella, Zell. Folkestone
 — nigra, Haw. Lee, Bexley, Alkham
 — hippophælla, Schr. Deal, Folkestone
 — malvella, Hb. Lee, Chislehurst
 — lentiginosella, Zell. Tunbridge Wells
 — ericetella, Hb. Generally distributed
 — mulinella, Zell. " "
 — sororculella, Hb. Bexley, Eltham, Shooters Hill, Lee, Chislehurst, etc.
 — diffinis, Haw., Sta. Bexley, Chislehurst
 — rhombella, Schiff. Lee, Eltham, Grove Park
 — distinctella, Zell., Sta. Bexley
 — scalella, Scop. Swanscombe, Chattenden, Chislehurst, Bexley, Shooters Hill, Darentb
 Brachmia mouffetella, Schiff. Lee, Pembury, Eltham, Bexley, Chislehurst
 Bryotropha terrella, Hb., Sta. Generally distributed
 — desertella, Dougl., Sta. Deal
 — senectella, Zell., Sta. Lee, Stone, Shoreham, Chislehurst, etc.
 — similis, Dougl. Lee, Charlton
 — affinis, Dougl. Mottingham, Cliffe, Charlton, Bexley, Lee, Lewisham
 — basaltinella, Zell., Sta. Swanscombe, Chattenden
 — domestica, Haw., Sta. Bexley, Lee, Tenderden, Dartford, Chislehurst
 Lita acuminatella, Sircom. Dover, Bexley, Shoreham

A HISTORY OF KENT

- Lita artemisiella*, Tr. *Bexley, Alkham, Shoreham*
 — *costella*, Westw., Sta. *Lee, Pembury, Lewisham*
 — *maculea*, Haw., St. *Lewisham, Tenterden, Lee, Chislehurst, Eltham*, etc.
 — *blandulella*, Tutt. *Deal*
 — *tricolorella*, Haw., Sta. Generally distributed
 — *fraternella*, Dougl. *Lee, Lewisham, Eltham, Chislehurst*
 — *maculiferella*, Dougl. *Lewisham, Lee, Eltham*
 — *semidecandrella*, Sta. & Thelf. *Deal*
 — *marmorea*, Haw., Sta. *Deal*
 — *obsoletella*, Fisch., Sta. *Lee*
 — *salicorniæ*, Hernig.
 — *atriplicella*, Fisch., Sta. Generally distributed
Teleia proximella, Hb., Sta. Generally distributed
 — *notatella*, Hb., Sta. *Chislehurst, Pembury, Darenth, Eltham*
 — *vulgella*, Hb., Sta. Generally distributed
 — *luculella*, Hb.
 — *scriptella*, Hb., Sta. *Lewisham, Pembury, Eltham, Kidbrooke, Lee*
 — *fugitivella*, Zell., Sta. Generally distributed
 — *sequax*, Haw., Sta. *Dover, Alkham, Shoreham, Stone, Bexley*, etc.
 — *dodecella*, L., Sta. Generally distributed
 — *triparella*, Zell., Sta. *West Wickham, Lee, Kidbrooke, Darenth*, etc.
Recurvaria leucateila, Clerck, L. Generally distributed
 — *nanella*, Hb. *Bexley, Lee, Pembury, Charlton, Eltham*, etc.
Pœcilia nivea, Haw. *Darenth, Bexley, Eltham*
 — *albiceps*, Zell., Sta. *Eltham, Lee, Lewisham, Bexley*, etc.
Argyritis pictella, Zell., Sta. *Deal, Dover*
Nannodia stipella, Hb. *Bexley, Alkham, Lee, Chislehurst, Pembury*
 — *hermannella*, Fb., Sta. *Eltham, Lee, Chislehurst, Bexley, Greenwich*
Apodia bifractella, Mann., Sta. *Shoreham, Dover, Stone*
Ptocheuusa inopella, Zell., Sta. *Folkestone, Northfleet, Shoreham, Chattenden, Lewisham, Pembury*
 — *osseella*, Sta. *Deal, Chattenden*
 — *subocellea*, St. *Alkham, Dover, Shoreham, Pembury*
Ergatis ericinella, Dup., Sta. *Dartford Heath, West Wickham*
Doryphora palustrella, Dougl. *Deal*
 — *arundinetella*, Zell. *Lee*
 — *lutulentella*, Zell., Sta. *Dartford Heath*
 — *servella*, Hb. *Shooters Hill*
Monochroa tenebrella, Hb., St. Generally distributed
Lamprotes atrella, Haw., Sta. *Lee, Perry Street, Bexley*
Anacampsis albipalpella, H.S.
 — *ligulella*, Zell., Sta. *Alkham, Chattenden, Pembury*
 — *vorticella*, Scop. *Pembury*
 — *tæniollella*, Tr. Generally distributed
 — *immaculatella*, Dougl. *West Wickham*
 — *anthyllidella*, Hb., Sta. Generally distributed
Acanthopila alacella, Dup. *Bexley*
Tachyptilia populella, Clerck. Generally distributed
Brachycrossata cinerella, Clerck. *Darenth, Shoreham, Pembury, Bexley, Chattenden*
Ceratophora rufescens, Haw. Generally distributed
Cladodes gerronella, Zell. *Chislehurst, Lee, Bexley, Tunbridge Wells*
Parasia lappella, L. *Shoreham, Folkestone, Dover, Bexley*
 — *metzneriella*, Sta. *Chattenden, Alkham, Charlton*
 — *carlinella*, Dougl. *Shoreham, Folkestone*
 — *neuropterella*, Fisch. *Deal, Dover, Stone*
Cleodora cytisella, Curt. *Bexley, Lee, Chislehurst, Pembury*
 — *striatella*, Hb. *Lewisham*
Cheleria hübnereila, Don. *Bexley, Eltham, West Wickham, Shoreham, Perry Street*
Anarsia spartiella, Schr. *Dover, Chislehurst, Pembury, Alkham*
 — *genistæ*, Sta. *Lee, Alkham, Pembury*
Hypsilophus schmidiellus. *Dover, Greenhithe*
 — *marginellus*, Fb. *Shoreham*
Sophronia parenthesesella, L. *Bexley, Shoreham, West Wickham, Alkham, Lewisham*
Pleurota bicostella, Clerck. *Chislehurst, Pembury*
Harpella geoffrella, L. Generally distributed
Hypercallia citrinalis, Scop. *Shoreham, Darenth, Kemsing, Greenhithe, Sevenoaks*
Dasycera sulphurella, Fb. Generally distributed
 — *olivierella*, Fb. *Tenterden, Lee, Chattenden, Darenth, Pembury, Eltham, Bexley, Stone*
Œcophora minutella, L. *Bexley, Swanscombe, Chattenden, Darenth, Pembury*
 — *fulviguttella*, Zell. *Pembury, Lee*
 — *tripuncta*, Haw. *Greenhithe, Tenterden, Pembury*
 — *augustella*, Hb. *Bexley, Mottingham*
 — *lunaris*, Haw. *Lewisham, Bexley, Eltham, Pembury, Chislehurst, Lee, Darenth*
 — *lambdella*, Don. *Charlton*
 — *tinctella*, Hb. *West Wickham, Chattenden, Pembury*

INSECTS

- Cecophora panzerella*, St. *Plumstead, Bexley, Swanscombe, Seal, Darent*
 — *unitella*, Hb. *Lee, Pembury, Stone, Bexley*
 — *flavifrontella*, Hb. *Eltham, West Wickham, Pembury, Bexley, Chislehurst*
 — *fuscescens*, Haw. Generally distributed
 — *pseudospretella*, Sta. " "
Cecogenia quadripuncta, Haw. *Lee, Eltham, Chislehurst, Forest Hill*
Endrosis fenestrella, Scop. Generally distributed
Butalis grandipennis, Haw. *Pembury*
 — *senescens*, Sta. *Shoreham, Alkham*
 — *laminella*, H.S. *Cuxton*
Amphisbatis incongruella, Sta. *West Wickham*
Pancalia latreillella, Curt. *Pembury*
 — *lewenhœkella*, L. *Shoreham, Alkham, Bexley, Farningham, Pembury, Darent*
Argyresthia curvella, L., Sta. *West Wickham, Lee, Bexley, Charlton, Chattenden, Pembury, Tenterden*
 — *pygmæella*, Hb. Generally distributed
 — *gœdartaella*, L. " "
 — *brochella*, Hb. " "
 — *atmoriella*, Bnks. *Bexley, Chislehurst*
 — *arceuthina*, Zell. *Shoreham*
 — *aurulentella*, Zell. *Tenterden*
Cedestis farinatella, Dup. Generally distributed
 — *gysselinella*, Dup. Near *Walmer and Dover*
Ocnorostoma piniariella, Zell. Generally distributed
Zelleria hepariella, Mann. *Dartford Heath, Pembury*

GRACILARIIDÆ

- Gracilaria alchimiella*, Scop. Generally distributed
 — *stigmatella*, Fb. Generally distributed
 — *hemidactylella*, Fb. *Pembury*
 — *populetorum*, Zell. *Birch Wood*
 — *elongella*, L. *Eltham, Chislehurst, Bexley, Tenterden*
 — *tringipennella*, Zell. *Lee, Chattenden, Chislehurst, Alkham, Pembury*
 — *syringella*, Fb. Generally distributed
 — *omissella*, Dougl. *Darent, Bexley, Stone, Lee, Plumstead, Mottingham*
 — *phasianpennella*, Hb. *Pembury*
 — *auroguttella*, St. *West Wickham, Eltham, Lee, Bexley, Lewisham, Tenterden*
 — *ononidis*, Zell. *Pembury, Dover*
Coriscium brongiartellum, Fb. *Bexley*
 — *cuculipennellum*, Hb. *Dartford Heath, Pembury*
Ornix avellanella, Sta. Generally distributed
 — *anglicella*, Sta. " "
 — *betulæ*, Sta. " "
 — *scutulatella*, Sta. *Dartford Heath*
 — *torquillella*, Sta. *Pembury*
 — *guttea*, Haw. *Lee, Eltham, Chattenden, Darent, Pembury, Tenterden*

COLEOPHORIDÆ

- Argyresthia ephippella*, Fb., Sta. *Pembury*
 — *nitidella*, Fb., Sta. Generally distributed
 — *semitestacella*, Curt. *Pembury, West Wickham, Bexley, Shoreham*
 — *spiniella*, Zell., Sta. *Pembury*
 — *albistria*, Haw. Generally distributed
 — *conjugella*, Zell. *Plumstead, West Wickham, Bexley*
 — *semifusca*, Haw. Generally distributed
 — *mendica*, Haw. *Greenhithe, Bexley, Chattenden, Darent, Pembury*
 — *glauicella*, Zell. *Eltham, Darent, Bexley*
 — *retinella*, Zell. Generally distributed
 — *dilectella*, Zell. *Lee*
Goniodoma auroguttella, Fisch. *Gravesend*
Coleophora fabriciella, Vill. *Lee, Forest Hill*
 — *deauratella*, Lien. *Pembury, Lee*
 — *fuscocuprella*, H.S. *Plumstead, Bexley, Darent, Chattenden, Stone*
 — *alcyonipennella*, Kol. *Lee, Bexley, Alkham, Mottingham*
 — *paripennella*, Zell., Sta. *Kidbrooke, Chislehurst, Lee, Darent, Bexley*
 — *potentillæ*, Sta. *Chislehurst*
 — *wockeella*, Zell. *Canterbury, Pembury*
 — *ochrea*, Haw. *Alkham*
 — *lixella*, Zell. *Shoreham, Alkham, Cuxton*

A HISTORY OF KENT

Coleophora vibicella, Hb. *Chattenden*
 — *conspicua*, Mann. *Cuxton*
 — *pyrrhulipennella*. *Dartford Heath*
 — *albicosta*, Haw. Generally distributed
 — *vulnerariae*, Zell. *Deal*
 — *anatipennella*, Hb. *Chattenden, Folkestone, Lee, Puddle Dock, Eltham, etc.*
 — *palliatella*, Zinck. *Eltham, Pembury, Chattenden, West Wickham, Darent, etc.*
 — *ibipennella*, Heyd. *Chislehurst, Lewisham, Darent, West Wickham, Bexley, etc.*
 — *ardeapennella*, Scott. *Darent, Chattenden, Eltham, Bexley*
 — *currucipennella*, Fisch. *Chattenden, Tenterden*
 — *niveicostella*, Fisch. *Shoreham, Dartford Heath, Cuxton*
 — *discordella*, Zell. *Shoreham, Pembury, Forest Hill*
 — *genistæ*, Sta. *Chislehurst, Dartford Heath*
 — *saturatella*, Sta. *Chattenden, Lee, Stone, Charlton*
 — *onosmella*, Brahm. *Dover, Alkham*
 — *conyzæ*, Zell. *Shoreham, Cuxton, Dover*
 — *inflata*, Sta. *Lee, Swanley, Greenhithe*
 — *therinella*, Tgstr. *Lee, Mottingham*
 — *maritimella*, Sta. *Thames marshes*
 — *troglydytella*, Dup. Generally distributed
 — *lineolea*, Haw. "
 — *murinipennella*, Fisch. *Pembury*
 — *cæspititiella*, Zell. Generally distributed
 — *laripennella*, Zett. *Lee, Shoreham*
 — *apicella*, Sta. *Tunbridge Wells*
 — *argentula*, Zell. *Lee*
 — *tripoliella*, Hodgk. *Thames marshes*
 — *virgaureæ*, Sta. *Darent, Plumstead, Bexley, etc.*
 — *hemerobiella*, Scop. *Charlton*
 — *juncicolella*, Sta. *Dartford Heath, Chislehurst*
 — *laricella*, Hb. *West Wickham, Chislehurst, Bexley*
 — *albitarsella*, Zell., Sta. *Mottingham, Dover, Plumstead, Tenterden, Lewisham*
 — *nigricella*, St., Sta. Generally distributed
 — *fuscedinella*, Zell., Sta. Generally distributed
 — *gryphipennella*, Bouché. *Plumstead, Lee, Tenterden, Hither Green*
 — *siccifolia*, Sta. *Lewisham, Tenterden*
 — *bicolorella*, Scott. *Eltham, West Wickham, Greenhithe, Mottingham*
 — *viminetella*, Heyd. *Lee, Eltham*
 — *olivaceella*, Sta. *Bexley, Lee, St. Mary Cray, West Wickham*
 — *solitariella*, Zell. Generally distributed
 — *lutipennella*, Zell. *Eltham, Bexley*
 — *badiipennella*, Fisch. *Erith, Lee, Mottingham*

Coleophora limosipennella, Fisch. *Chislehurst, Stone, Bexley, Darent, Abbey Wood, Lewisham*
 — *wilkinsoni*, Scott. *Chislehurst, Bexley, Darent*

ELACHISTIDÆ

Bedellia somnulentella, Zell. *Lewisham*
Stathmopoda pedella, L. *Lewisham*
Cosmopteryx eximia, Haw. *Lewisham, Sevenoaks*
Batrachedra præangusta, Haw. *Lee, Pembury, Bexley, Eltham, etc.*
 — *pinicolella*, Dup. *Bexley, Lee, Dover*
Ænophila v-flava, Haw. *Beckenham*
Chauliodus insecurellus, Sta.
 — *illigerellus*, Hb. *Deal, Chislehurst, Dover*
Laverna propinquella, Sta. *Chattenden, Bexley*
 — *miscella*, Schiff. *Dover, Greenhithe, Alkham*
 — *stephensi*, Sta. *Greenhithe*
 — *epilobiella*, Schr. Generally distributed
 — *ochraceella*, Curt. *Eltham, Lee*
 — *decorella*, St. *Pembury*
 — *subbistrigella*, Haw. *Bexley, Darent, Pembury, Falkham, Halstead, Chelsfield*
 — *vinolentella*, H.S. *Lee*
 — *hellerella*, Dup. *Bexley, Lee, Swanscombe, Eltham*
 — *atra*, Haw. *Alkham, Lewisham*
 — *ramniella*, Zell. *Greenhithe, Pembury*
Chrysoclysta linneella, Clerck. *Lee, Eltham*
 — *bimaculella*. *Eltham, Chattenden*
 — *aurifrontella*, Hb. *Lee, Eltham, Pembury, Bexley, Chattenden, Charlton, Chislehurst*
Asychna profugella, Zell. *Kensing*
 — *modestella*, Dup. *Eltham, Lewisham, Chattenden, Pembury, Stone*
 — *æratella*, Zell. *Darent, Pembury*
 — *terminella*, Dale. *West Wickham, Pembury*
Antispila pfeifferella, Hb. *Eleham, Bexley, Mottingham, Alkham, Let, Stone, Pembury, etc.*
 — *treitschkiella*, Fisch. *Lewisham, Dover, Plumstead, Lee*
Stephensia brunnichella, L., Sta. *Shoreham*
Elachista gleichenella, Fb., Sta. *Pembury, West Wickham, Bexley, Chattenden*
 — *magnificella*, Tgstr. *West Wickham*
 — *albifrontella*, Hb. Generally distributed
 — *atricomella*, Sta. *Alkham, Lee, Swanscombe, Eltham, Pembury, Chattenden, Bexley*
 — *luticomella*, Zell., Sta. *Beckenham, Eltham, Lee, Bexley, Chattenden*
 — *poæ*, Dougl. *Lewisham, Greenwich, Lee*
 — *cinereopunctella*, Haw. *Chattenden, Tenterden, Pembury*
 — *trapeziella*, H.S. *West Wickham*

INSECTS

- Elachista stabilella*, Sta. *Eltham, Bexley*
 — *nigrella*, Hb. *Eltham, Alkham, Beckenham, Swanscombe, Pembury, Chislehurst*
 — *subnigrella*, Dougl. *Eltham*
 — *humilis*, Zell. *West Wickham*
 — *perplexella*, Sta. *Beckenham*
 — *bedellella*, Sircom. *Pembury*
 — *obscuraella*, Sta. Generally distributed
 — *zonariella*, Tgstr. *Lee*
 — *gangabella*, Fisch. *Alkham, Chattenden, Beckenham, Swanscombe*
 — *tæniatella*, Sta. *Bexley, Chattenden, West Wickham*
 — *megeriella*, Zell. *Eltham, Lee, Darent, Alkham, Stone, Chattenden, Pembury, etc.*
 — *adscitella*, Sta. *Eltham*
 — *cerussella*, Hb. *Lewisham*
 — *biatomella*, Sta. *Lee, Dover, Chattenden, Shoreham*
 — *triatomea*, Haw. *Alkham, Shoreham, Lee, Dover*
 — *pollinariella*, Zell. *Bexley, Chattenden, Shoreham*
 — *rufocinerea*, Haw. Generally distributed
 — *subalbidella*, Schl. *West Wickham, Pembury, Chislehurst*
 — *argentella*, Clerck. *Folkestone, Lee, Eltham, Dover, Chislehurst, Darent, Alkham*
Tischeria complanella, Hb. *Chattenden, Pembury, Mottingham, West Wickham, Bexley, etc.*
 — *dodonæa*, Heyd. *West Wickham, Abbey Wood*
 — *marginæa*, Haw. *Bexley, Chislehurst, Pembury, Eltham, Tenterden, etc.*

LITHOCOLLETIDÆ

- Lithocolletis roboris*, Zell. *Tenterden*
 — *lantanela*, Schr. *Greenhithe, Stone, Bexley, Pembury, Shoreham, Otford, etc.*
 — *irradiella*, Scott. *Beckenham*
 — *bremiella*, Zell. *Bexley, Darent, Stone*
 — *lautella*, Zell. *Eltham, Chislehurst, Tenterden, Pembury*
 — *cavella*, Zell. *Chislehurst, Bexley, West Wickham, Darent*
 — *concomitella*, Bkns. Generally distributed
 — *blancardella*, Fb. " "
 — *oxyacanthæ*, Frey. " "
 — *sorbi*, Frey. *Lee*
 — *cerasicolella*, H.S. *Greenhithe, Bexley*
 — *coryli*, Nicelli. *Kidbrooke, Pembury, Lee, Bexley*
 — *spinicolella*, Kol. *Eltham, Bexley, Pembury*
 — *faginella*, Mann. *West Wickham, Mottingham, Pembury*
 — *mespilella*, Hb. *Lewisham, Lee*

- Lithocolletis salicicolella*, Sircom. *Eltham, Chislehurst, Pembury, Lewisham*
 — *viminetorum*, Sta. *Lewisham, Chislehurst*
 — *carpinicolella*, Sta. *Mottingham, Lee, Bexley, Lewisham, Pembury*
 — *ulmifoliella*, Hb. Generally distributed
 — *spinolella*, Dup. " "
 — *quercifoliella*, Fisch. " "
 — *messaniella*, Zell. " "
 — *corylifoliella*, Haw. " "
 — *viminiella*, Sircom. *Chislehurst, Eltham*
 — *scopariella*, Fisch. *Lee, Dartford Heath*
 — *ulicicolella*, Vaughan. *Dartford Heath*
 — *alnifoliella*, Hb. Generally distributed
 — *heegeriella*, Zell. *Pembury, Tenterden*
 — *cramerella*, Fb. Generally distributed
 — *tenella*, Zell. *Mottingham, Lee, Bexley*
 — *sylvella*, Haw. *Lewisham, Pembury, Bexley, Mottingham, Kidbrooke, Eltham, Lee*
 — *emberizopennella*. *West Wickham, Pembury, Bexley, Eltham, Darent*
 — *frölichella*, Zell. *Tenterden*
 — *dunningiella*, Sta. *Pembury, Bexley*
 — *nicellii*, Zell. *West Wickham, Plumstead, Bexley, Lee, Eltham*
 — *settinensis*, Nicelli. *Eltham, Beckenham*
 — *schreberella*, Fb. *Lewisham, Lee, Dartford, Erith, etc.*
 — *tristrigella*, Haw. *Lewisham, Bexley*
 — *trifasciella*, Haw. *Tenterden, Darent, Bexley, Seal, Pembury*
 — *comparella*, Fisch. *Eltham, Blackheath, Lee, Beckenham*

LYONETIIDÆ

- Lyonetia clerckella*, L. *Bexley, Greenhithe, Pembury*
Phyllocnistis suffusella, Zell. *Beckenham, Bexley, Chislehurst, Mottingham, Eltham, Riverhead, Halstead*
 — *saligna*, Zell. *Chislehurst, Pembury*
Cemistoma spartifoliella, Hb. *Pembury, Lee*
 — *laburnella*, Heyd. *Lee, Eltham, Shoreham, Charlton*
 — *scitella*, Zell. *Lee, Tenterden, Bexley*
 — *wailesella*, Sta. *Tunbridge Wells, Pembury*
Opostega salaciella, Tr. *Dartford Heath, Lee*
Bucculatrix nigricomella, Zell. *Lee, Mottingham*
 — *cidarella*, Tisch. *Eltham, Bexley, Pembury*
 — *ulmella*, Mann. *Bexley, Pembury, Darent, West Wickham*
 — *artemisiella*, H.S. *Folkestone*
 — *cratægi*, Zell. *Bexley, Chattenden, Lewisham, Pembury*
 — *demaryella*, Dup. *Darent, Pembury*
 — *maritima*, Sta. *Thames marshes*

A HISTORY OF KENT

Bucculatrix boyerella, Dup. *Eltham, Bexley, Greenhithe, Sidcup, Mottingham, Pembury*
 — *frangulella*, Göze. *Darent, Tenterden, Pembury*
 — *thoracella*, Thnb. *Bexley*
 — *cristatella*, Fisch. *Lee, Black Fen*

NEPTICULIDÆ

Nepticula atricapitella, Haw. *Lewisham, Eltham, Beckenham, Chattenden, West Wickham*
 — *ruficapitella*, Haw. *Chattenden, Beckenham, Eltham, West Wickham, Lewisham*
 — *basiguttella*, Hein. *West Wickham*
 — *anomaella*, Göze. *Tenterden, Beckenham, Lee, Lewisham*
 — *pygmælla*, Haw. *Lewisham, Mottingham*
 — *pomella*, Vaughan. *Lewisham*
 — *oxyacanthella*, Sta. *Lewisham, Charlton, Dartford Heath, Mottingham*
 — *aucupariæ*, Frey. (?) *West Wickham*
 — *viscerella*, Dougl. *Lewisham, Norwood, Woodside, West Wickham*
 — *catharticella*, Sta. *Alkham, Darent, Lee, Lewisham*
 — *septembrella*, Sta. *Chattenden, Darent, Beckenham, Lewisham, West Wickham*
 — *intimella*, Zell., Sta. *Dartford Heath*
 — *subbimaculella*, Haw. *Chattenden, Chislehurst, Lewisham, Northfleet, Pembury*
 — *argyropeza*, Zell. *Beckenham*
 — *subapicella*, Sta. "
 — *trimaculella*, Haw. *Eltham, Lee, Lewisham*
 — *quinquella*, Bedell., Sta. *Beckenham, West Wickham*
 — *sericopeza*, Zell. *Dartford Heath, Lewisham*
 — *flosactella*, Haw. *Bexley, Chattenden, Darent, Eltham, Lewisham, Pembury, Tenterden*
 — *salicis*, Sta. *Chattenden, Eltham, Lewisham, Southborough*
 — *microtheriella*, Wing. *Beckenham, Chattenden, Darent, Lewisham, Plumstead*
 — *betulicola*, St. *Chislehurst, Darent, West Wickham*
 — *ignobilella*, Sta. *Beckenham, Lewisham*
 — *argentipedella*, Zell. *Bexley, Chislehurst, Darent, Eltham, Dartford Heath, West Wickham*
 — *plagicolella*, Sta. *Darent, Dartford Heath, Eltham, Lewisham*
 — *turicella*, H.S. *Bexley*
 — *basalella*, H.S. *Lewisham*
 — *malella*, Sta. "
 — *angulifasciella*, Sta. *Beckenham, Lewisham*
 — *atricollis*, Sta. *Lewisham*
 — *arcuatella*, H.S. *West Wickham*
 — *gratiosella*, Sta. *Lewisham, Beckenham*
 — *poterii*. *Folkestone Warren*

Nepticula acetosa. *Folkestone Warren*
 — *ulmivora*, Hein. *West Wickham*
 — *marginicolella*, Sta. *Beckenham, Lewisham, West Wickham*
 — *alnetella*, Sta. *Beckenham, Eltham, Lewisham*
 — *glutinosæ*, Sta. *Eltham*
 — *continuella*, Sta. *Lewisham*
 — *ænofasciella*, H.S. *Folkestone*
 — *aurella*, Fb. *Lewisham, West Wickham, Tenterden*
 — *gei*, Wk. *Chislehurst*
 — *splendidissimella*, H.S.
 — *luteella*, Sta. *Dartford Heath, Lewisham, West Wickham*
 — *regiella*, H.S. *Darent, Dartford Heath*
Trifurcula atrifrontella, Sta. *Bexley, Lewisham*
 — *squamataella*, Sta. *Charlton*
 — *immundella*, Zell., Sta. *Charlton, Lee*
 — *pulverosella*, Sta. *Lewisham, Eltham*

PTEROPHORI

Agdistes bennettii, Curt. *Gravesend, Sheerness*
Cnœmidorphus rhodactylus, Fb. *Chattenden, Lewisham, Plumstead*
Platyptilia bertrami, Hb. *Dover, Alkham, Pembury*
 — *gonodactyla*, Schiff. Generally distributed
 — *zetterstedtii*. *Sydenham, Dover*
Amblyptilia acanthodactyla, Hb. Generally distributed
 — *cosmodactyla*, Hb. *Pembury, Dover*
 — *parvidactylus*. *Alkham, Charlton, Cuxton, Pembury, Shoreham*
 — *teucii*, Greening. *Shoreham, Dover*
 — *lætus*, Zell. *Dover, St. Margaret's Bay*
 — *pilosellæ*, Zell. *Dover, Folkestone*
Mimoseoptilus phæodactylus, Hb. *Alkham, Bexley, Cuxton, Lee, Shoreham*
 — *bipunctidactylus*, Haw. *Chattenden, Dover, Pembury, Alkham*
 — *plagiodactyla*, Stn. *Chattenden, Shoreham*
 — *pterodactylus*, L. Generally distributed
Œdematophorus lithodactylus, Tr. *Chattenden, Dover*
Pterophorus monodactylus, L. Generally distributed
Leioptilus lienigianus, Zell. *Deal, Dover, Eltham, Lee, Bexley, Mottingham*
 — *tephradactylus*, Hb. *Pembury, Dover*
 — *osteodactylus*, Zell. *Darent, Dover*
 — *microdactylus*, Hb. *Alkham, Dover, Pembury*
Aciptilia galactodactyla, Hb. *Bexley, Ightham, Darent, Shoreham, Pembury, Tenterden*
 — *baliodactyla*, Zell. *Dover*
 — *tetradactyla*, L. *Shoreham, Dover, Alkham, Pembury*
 — *pentadactyla*, L. Generally distributed
Alucita polydactyla. " "

INSECTS

DIPTERA

Flies

In consequence of the paucity of collectors of this order, especially in Kent, I am only able to supply the following meagre list of Diptera. It contains the names of such species as are known by me to occur in Kent, supplemented by the names of species whose occurrence in the county has been recorded by Walker, Curtis, Haliday, Verrall and others.

A large number of species are recorded by Verrall in his *British Flies*, vol. viii., and in his 'List of British Tipulidæ' (*E.M.M.* vol. xxiii. 1888), with indefinite localities, such as 'Penzance to Tongue.' Probably all these occur in the county, but they have not been collated where a definite Kentish locality cannot be assigned to them.

Many common species, e.g. *Culex pipiens*, *Musca domestica*, etc., etc., must occur, but as they have not been recorded, nor are specimens of them in local collections, they are omitted.

A list of Diptera taken in the neighbourhood of Maidstone has been sent me by Mr. H. Elgar, and thirty-one species therefrom have been added to my list. Mr. Elgar has also sent many additional localities, which are also enumerated, for species already recorded.

After all the total number of species for the county does not reach 350, a poor proportion out of the 2,800 named in Verrall's 'List' ed. 2.

PULICIDÆ

Hystriophysylla talpæ, Curt. *Halstow*

CECIDOMYIDÆ

Cecidomyia reaumuri, Brein. *Wye* (galls only)

Diplosis botularia, Wim. *Kent* (Theobald)

MYCETOPHILIDÆ

Empheria pictipennis, Hal. *Kent* (Walker)

Platyura marginata,* Mg. *Barming* (Elgar)

Macrocera vittata, Mg. *Bearsted*

— *stigma*, Curtis. "

BIBIONIDÆ

Scatopse notata, Linn. *Maidstone*

— *incompleta*, Verr. *Abbey Wood*

— *brevicornis*, Mg. *Folkestone*

Dilophus febrilis, Linn. "

Bibio venosus, Mg. *Birch Wood*, ? *St. Mary Gray* (Curtis)

— *laniger*, Mg. *Folkestone*

— *varipes*, Mg. *Bexley* (Haliday)

— *marci*, Linn. *Common* (Elgar)

— *hortulanus*, Linn. " "

— *johannis*, Linn. *Folkestone*

— *sp. inc near hortulanus*. *Bearsted*

CHIRONOMIDÆ

Chironomus viridis, Mcq. *Folkestone*

Ceratopogon pictus, Mg. *Kent* (Walker)

CULICIDÆ

Anopheles maculipennis, Mg. *Wye*

— *nigripes*, Stæg. *Wye* (Nuttall)

Culex diversus, Theob. *Tunbridge Wells* (Theobald)

— *dorsalis*, Mg. *Lewisham*

TIPULIDÆ

Ptychoptera contaminata, Linn. *Gravesend*

— *paludosa*, Mg. *Bearsted*

Limnobia nubeculosa, Mg. *Folkestone*

— *analís*, Mg., Verr. *Plumstead*

— *nigropunctata*, Schum. *Darent*

— *macrostigma*, Schum. *Tunbridge Wells*

Dicranomyia sericata, Mg. *Kent* (Verrall, *E.M.M.* vol. xxiii.)

— *pilipennis*, Egg. *Kent* (Verrall, *E.M.M.* vol. xxiii.)

Rhamphidia longirostris, Mg. *Tunbridge Wells*

Molophilus appendiculatus, Stæg. *Kent* (Verrall, *E.M.M.* vol. xxiii.)

— *propinquus*, Egg. *Kent* (Verrall, *E.M.M.* vol. xxiii.)

Erioptera macrophthalma, Lw. *Tunbridge Wells*

NOTE.—Of species marked with an * either the record is doubtful, or doubts exist as to whether the locality is within the boundaries of the county.—J. W. Y.

A HISTORY OF KENT

TIPULIDÆ (continued)

- Ephelia submarmorata*, Verr. *Tunbridge Wells*
Limnophila dispar, Mg. *Kent* (Verrall,
E.M.M. vol. xxiii.)
— *ferruginea*, Mg. *Kent* (Verrall, *E.M.M.*
vol. xxiii.)
— *filata*, Walk. *Kent* (Verrall, *E.M.M.*
vol. xxiii.)
Adelphomyia senilis, Hal. *Kent* (Verrall,
E.M.M. vol. xxiii.)
Pachyrhina imperialis, Mg. *St. Mary*
Cray, Tunbridge Wells
— *quadrifaria*, Mg. *Maidstone*
— *annulicornis*, Mg. *Tunbridge Wells*
Tipula varipennis, Mg. *Folkestone*
— *scripta*, Mg. *Maidstone*
— *flavolineata*, Mg. *Darenth*
— *lateralis*, Mg. *Gravesend*
— *vernalis*, Mg. *Belvedere*
— *oleracea*, Linn. *Folkestone*
— *fascipennis*, Mg. *Kent* (Verrall, *E.M.M.*
vol. xxiii.)
— *ochracea*, Mg. *Tunbridge Wells*
Dictenidia bimaculata, Linn. *Darenth*
(Curtis)
Ctenophora pectinicornis, Linn. *Darenth*
(Curtis)

RHYPHIDÆ

- Rhyphus fenestralis*, Scop. *Bearsted*

STRATIOMYIDÆ

- Pachygaster atra*, Panz. *Maidstone*
Ephippium thoracicum, Ltr. *Darenth*
(Walk. *Dip. Brit.*)
Nemotelus pantherinus, Linn. *North Cray*
(Curtis)
— *uliginosus*, Linn. *Gravesend*
Oxycera pulchella, Mg. *Belvedere*
— *trilineata*, Fab. *Belvedere, Gravesend*
Stratiomys furcata, Fab. *Gravesend*
— *furcata* var. *riparia*, Mg. *Gravesend*,
Plumstead
— *longicornis*, Scop. *Gravesend, Belvedere*
Odontomyia ornata, Mg. *Gravesend*
— *tigrina*, Fab. *Gravesend*
— *viridula*, Fab. "
Chloromyia formosa, Scop. *Gravesend*,
Folkestone
Microchrysa polita, Linn. *Bearsted*
— *flavicornis*, Mg. *Dover* (Curtis)
Beris clavipes, Linn. *Bearsted*
— *vallata*, Forst. *Maidstone*
— *chalybeata*, Forst. *Darenth*

LEPTIDÆ

- Atherix ibis*, Fab. *Darenth* (Curtis)
— *marginata*, Fab. "
Symphoromyia immaculata, Fab. *Darenth*
(Walker)
*Chrysopila helvola** *Sandwich* (Curtis).
Recorded by Curtis, but collated
with doubt

ASILIDÆ

- Dioctria atricapilla*, Mg. *Gravesend*
— *rufipes*, Deg. *Gravesend*
— *baumhaueri*, Mg. *Bearsted*
Isopogon brevirostris, Mg. *Darenth* (Curtis)
Laphria marginata, Linn. "
Asilus crabroniformis, Linn. "*Maidstone*
(Elgar)
Neoitamus cyanurus, Lw. *Darenth*
Dysmachus trigonus, Mg. *Bearsted*

BOMBYLIDÆ

- Bombylius discolor*, Mik. *Maidstone*
— *major*, Linn. *Maidstone, Yalding*
Systoechus ctenopterus (?) * and
Exoprosopa pandora (?) * Recorded by
Curtis, but probably incorrect
Anthrax hottentota, Linn. *Upper Halling*
(Elgar)

THEREVIDÆ

- Thereva plebeia*, Linn. *Folkestone*

SCENOPINIDÆ

- Scenopinus fenestralis*, Linn. *Bearsted*

EMPIDÆ

- Empis pennaria*, Fln. *Darenth*
— *lutea*, Mg. *Dover* (Curtis, *Platyptera*
ochrea)
— *tessellata* Fab. *Common* (Elgar)
Hilara maura, Fab. *St. Mary Cray*
Stilpon graminum, Fln. *Bexley* (Haliday)

DOLICHOPODIDÆ

- Dolichopus virgultorum*, * Hal. *Malling*
— *clavipes*, * Hal. *Malling*
— *æneus*, Deg. *Hythe*
Pœcilobothrus nobilitatus, Linn. *Gravesend*
Hercostomus cretifer, Wlk. *Harrietsham*
(Walker, *alulifer*)
Porphyrops pencillata, Lw. *Deal* (Verrall,
E.M.M. 1894)
— *nasuta*, Fln. *Deal* (Verrall, *E.M.M.*
1894)
Xiphandrum caliginosum, Mg. *Abbey Wood*
Scellus notatus, Fab. *Bromley* (Curtis)

PLATYPEZIDÆ

- Platycnema pulicaria*, Fln. *St. Mary Cray*
Callimyia amœna, Mg. *Kent* (Verrall)
— *speciosa*, Mg. *St. Mary Cray*
Platypeza consobrina, Ztt. *St. Mary Cray*
— *rufa*, Mg. *St. Mary Cray*
— *fasciata*, Mg. "
— *infumata*, Hal. *Kent* (Verrall)

PIPUNCULIDÆ

- Chalarus spurius*, Fln. *Kent* (Verrall)
Verrallia aucta, Fln. "
— *pilosa*, Ztt. "
— *villosa* v. *Ros.* "
Pipunculus furcatus, Egg. "
— *modestus*, Hal. *Kent* (Haliday)
— *hæmorrhoidalis*, Ztt. *Abbey Wood*

SYRPHIDÆ

- Paragus tibialis*, Fln. *Folkestone*

INSECTS

SYRPHIDÆ (continued)

- Pipizella virens, Fab. *Belvedere*
 — flavitarsis, * Mg. *Barming* (Elgar)
 — heringi, Ztt. *St. Mary Cray*
 Pipiza luteitarsis, Ztt. *Darenth*
 — quadrimaculata, Panz. *Folkestone*
 — bimaculata, * Mg. *Upper Halling* (Elgar)
 — signata, Mg. *Folkestone*
 Chrysogaster solstitialis, Fln. *Herne Bay*
 Chilosia antiqua (?), Mg. *Deptford* (Curtis)
 — scutellata, * Fln. *Maidstone, Barming* (Elgar)
 — variabilis (?), Panz. *Darenth* (Curtis)
 — grossa, Fln. *Darenth, Yalding*
 — soror, Ztt. *Folkestone*
 — albipila, Mg. *Kent* (Verrall)
 — proxima, Zett. " "
 Platychirus manicatus, Mg. *Old Charlton*
 — albinus, Fab. *Upper Halling* (Elgar)
 — fulviventris, Mcq. *Gravesend, Belvedere*
 — clypeatus, Mg. *Upper Halling* (Elgar)
 — angustatus, Ztt. *Kent* (Verrall)
 Pyrophæna granditarsa, Forst. *Gravesend*
 — rosarum, Fab. *Kent* (Verrall)
 Melanostoma ambiguum, Fln. *Darenth*
 — mellinum, Linn. *Folkestone*
 — scalare, Fab. *Plaxtol* (Elgar)
 Xanthandrus comtus, Harr. *Kent* (Verrall)
 Leucozona lucorum, Linn. *Folkestone*
 Ischyrosyrphus laternarius, Müll. *Herne Bay*
 Catabomba pyrastri, Linn. *Dover*
 — selenitica, * Mg. *West Wickham Wood* (Verrall)
 Syrphus albostrigatus, Fln. *Folkestone*
 — tricornis, Fall. *Barming, Ightham, Upper Halling* (Elgar)
 — venustus, Mg. *Folkestone* (Elgar)
 — vitripennis, Mg. *Maidstone, Ightham* (Elgar)
 — nitidicollis, Mg. *Kent* (Verrall)
 — latifasciatus, Mcq. " "
 — corollæ, Fab. *Maidstone*
 — luniger, Mg. *Old Charlton*
 — bifasciatus, Fab. *Barming, Ightham, Upper Halling* (Elgar)
 — balteatus, Deg. *Conbeath, Hollingbourne, Barming* (Elgar)
 — umbellatarum, Fab. *Bearsted* (Elgar)
 Sphærophoria scripta, Linn. (var. dispar, Lw.). *Old Charlton*
 — menthastri, Linn. *Boxley, Upper Halling, Barming* (Elgar)
 — flavicanda, Ztt. *Darenth*
 Xanthogramma citrofasciatum, Deg. *Belvedere, Folkestone*
 — ornatum, Mg. *Yalding, Merton, Fawkhams*

SYRPHIDÆ (continued)

- Baccha obscuripennis, Mg. *Bromley* (Curtis)
 Ascia podagrica, Fab. *Maidstone*
 — floralis, Mg. *Maidstone*
 Brachyopa bicolor, Fln. *Bearsted*
 Rhingia campestris, Mg. *Belvedere*
 Volucella pellucens, Linn. *Bearsted*
 — inflata, Fab. *Barming and Upper Halling* (Elgar); *Darenth* (Curtis)
 — bombylans, Linn. *Dover* (Curtis)
 Eristalis sepulchralis, Linn. *Old Charlton*
 — æneus, Scop. *Herne Bay, Gravesend, Upper Halling*
 — tenax, Linn. *Belvedere*
 — intricarius, Linn. *Barming, Barham, Abbey Wood, Boxley*
 — arbustorum, Linn. *Herne Bay*
 — pertinax, Scop. *Hollingbourne, Bredhurst, Boxley*
 — nemorum, Linn. *Kent* (Curtis), *Barming, Boxley*
 — horticola (?). *King's Wood, near Maidstone* (Elgar)
 Myiatropa florea, Linn. *Herne Bay*
 Helophilus trivittatus, Fab. *Dover, Old Charlton*
 — hybridus, Lw. *Old Charlton*
 — pendulus, Linn. *Old Charlton, Folkestone*
 — transfugus, Linn. *Old Charlton*
 — lineatus, Fab. *Kent* (Verrall)
 — vittatus, Mg. *Gravesend, Belvedere*
 Merodon equestris, Fab. *Beckenham*
 Tropidia scita, Harr. *Gravesend*
 Criorrhina berberina, Fab. *Barming, Upper Halling* (Elgar)
 — oxyacanthæ, Mg. *Kent* (Verrall)
 — floccosa, Mg. *Maidstone* (Elgar)
 — asilica, Fln. *Kent* (Verrall)
 Xylota segnis, Linn. *Dover* (Curtis)
 — sylvarum, Linn. *Herne Bay*
 — florum (?), Fab. *Barming* (Elgar)
 Syritta pipiens, Linn. *Folkestone*
 Eumerus strigatus, Fln. *Darenth, Abbey Wood, Lee*
 — ornatus, Mg. *Darenth, Barming, Upper Halling*
 Chrysochlamys cuprea, Scop. *Darenth, St. Mary Cray, Tunbridge Wells, Folkestone*
 Chrysotoxum cautum, Harr. *Kent* (Verrall), *Barming, Upper Halling*
 — octomaculatum, Curtis. *Merton, Maidstone*
 — elegans, Lw. *Kent* (Verrall)
 — festivum, Linn. *Deal, Upper Halling*
 — bicinctum, Linn. *Deal, Herne Bay*

CONOPIDÆ

- Conops quadrifasciatus, Deg. *Birch Wood, St. Mary Cray* (?) (Curtis)

A HISTORY OF KENT

CONOPIDÆ (continued)

Conops flavipes, Linné. *Birch Wood*
(Curtis)

Physocephala rufipes, Fab. *Deal*

Oncomyia atra, Fab. *Dover* (Curtis)

Sicus ferrugineus, Linné. *Darenth, Fawkham*

Myopa buccata, Linn. *Barming, Bredhurst* (Elgar)

MUSCIDÆ

Meigenia bisignata, Mg. *Maidstone*
(Meade, *E.M.M.* 1892)

Ceromasia senilis, Mg. *Gravesend, Old Charlton*

Gymnochæta viridis, Fln. *Folkestone*

Exorista fimbriata, Mg. *Kent* (Meade, *E.M.M.* 1891)

Epicampocera ambulans, Mg. *Darenth*

Blepharidea vulgaris, Fln.

Myxexorista macrops, Br. & Berg. *Darenth*
(Verrall, *E.M.M.* 1894)

Eutachina rustica, Mg. *Old Charlton*

Gonia fasciata, Mg. *Maidstone, Bearsted, Dover*

— *divisa*, Mg. *Darenth, Maidstone*

— *ornata*, Mg. *Darenth*

Somoleja rebaptizata, Rnd. *Gravesend, Old Charlton*

Macquartia tenebricosa, Ing. *Darenth*

— *grisea*, Fln. *Darenth*

Thelaira leucozona, Panz. *Maidstone*

Myobia sp. inc. *Maidstone*

Olivieria lateralis, Fab. *Maidstone, Gravesend*

Micropalpus pudicus, Rnd. *Bearsted*

Echinomyia grossa, Linné. *Deal*

— *fera*, Linn. *Common* (Elgar)

Servillia ursina, Mg. *Maidstone, Barming*

Digonichæta setipennis, Fln. *Maidstone*

Thryptocera minutissima, Ztt. *Old Charlton*

Siphona geniculata, Deg. *Belvedere, Old Charlton*

Allophora pusilla, Mg. *Gravesend*

Trixa cestroidea, Desv. *Belvedere*

Melanophora atra, Mcq. *Bearsted*

— *roralis*, Linn. *Maidstone*

Rhinophora atramentaria, Mg. *Belvedere*

— *simplicissima*, Lw. *Belvedere*

Sarcophaga carnaria, Linn. *Maidstone*

— *nigriventris*, Mg. *Folkestone, Belvedere*

— *offusca*, Schiner. *Folkestone*

Onesia sepulchralis, Linn. *Maidstone*

Nyctia halterata, Panz. *Maidstone, Fawkham*

Melanomyia nana, Mg. *Maidstone*

Macronychia agrestis, Fln. *Blackbeath*

Dexiosoma caninum, Fab. *Maidstone*

Stomoxys calcitrans, Linn. *Maidstone, Ramsgate, Folkestone*

MUSCIDÆ (continued)

Pollenia rudis, Fab. *Maidstone*

— *vespillo*, Fab. *Maidstone, Old Charlton*

Musca corvina, Fab. "

Graphomyia maculata, Scop. *Old Charlton*

Myiospila mediatunda, Fab. *Old Charlton, Folkestone, Gravesend*

Mesembrina meridiana, Linn. *Maidstone*
(Elgar)

Cyrtoneura curvipes, Mcq. *Maidstone*

— *hortorum*, Fln. *Maidstone, Folkestone*

— *stabulans*, Fln. *Old Charlton*

Protocalliphora groenlandica, Ztt. *Belvedere*

Calliphora cognata, Mg. *Maidstone*

— *micans*, Mg. *Belvedere*

— *erythrocephala*, Mg. *Folkestone, Maidstone*

Pyrellia lasiophthalma, Mcq. *Darenth*

— *eriphophthalma*, Mcq. *Maidstone*

Lucilia cornicina, Fab. *Folkestone*

— *cæsar*, Linn. *Old Charlton*

— *ruficeps*, Mg. *Maidstone*

Gastrophilus equi, Fab. *Deal*

[Recorded by Dr. Meade, but collated with doubt :—

? *Plesina nigrisquama*. *Maidstone* (*E.M.M.* 1894)

? *Aphria* ? *angustifrons*. *Folkestone* (*E.M.M.* 1894)

? *Exorista biserialis*. *Maidstone* (*E.M.M.* 1891)

? *Metopia argyrocephala*. *Kent* (*E.M.M.* 1892)

? *Anachætopsis ocypterina*. *Kent* (*E.M.M.* 1892)]

ANTHOMYIDÆ

Mydea urbana,* Mg. *Malling*

— *allotala*, Mg. *Lee* (Meade)

Spilogaster depuncta,* Fln. *Malling*

Hydrotæa arripes, Fab. *Darenth* (Curtis)

Hydrophoria conica, W. *Darenth*

Hylemyia puella, Mg. "

Chortophila albescens, Ztt. *Plumstead*

— *striolata*, Fln. *Darenth*

Allognata agromyzella, Rnd. *Tunbridge Wells*

Hoplogaster mollicula, Fln. *Darenth*
(Walker)

Lispe tentaculata, Deg. *Old Charlton*

CORDYLURIDÆ

Cordylura umbrosa, Mg. *Abbey Wood*

Paralleloma albipes, Fln. *Darenth*

Cnemopogon apicalis, Mg. "

Norellia spinimana, Fln. "

Spathiophora hydromyzina, Fln. *Gravesend*

Ceratinostoma ostiorum, Hal. *Gravesend, Folkestone*

INSECTS

CORDYLURIDÆ (continued)

- Scatophaga lutaria, Fab. *Bearsted*
- inquinata, Mg. *Darentb*
- stercoraria, Linn. *Old Charlton*
- merdaria, Fab. *Gravesend*
- dalmatica, Beck. "
- litorea, Fln. "

PHYCOTROMIDÆ

- Orygma luctuosum, Mg. *Folkestone*

HELOMYZIDÆ

- Hélomyza olens, Lw. (pallida, Fln. ?). *Darentb*
- pectoralis, Lw. *St. Mary Cray*

SCIOMYZIDÆ

- Dryomyza flaveola, Fab. *Bearsted*
- flaveola var. zawadskii, Schummel. *Plumstead*
- Sciomyza dorsata, Ztt. *Gravesend*
- Tetanocera elata, Fab. *Maidstone*
- lævifrons, Lw. *Blackbeath*
- ferruginea, Fln. *Gravesend*
- robusta, Lw. *Plumstead, Belvedere*
- reticulata, Fab. (= coryleti, Scop.). *Plumstead*
- punctulata, Scop. *Bearsted, Folkestone*
- Limnia marginata, Fab. *Gravesend, Herne Bay*
- unguicornis, Scop. *Bearsted*
- obliterated, Fab. *Maidstone, Belvedere*
- Elgiva albiseta, Scop. *Plumstead*
- rufa, Panz. *Kidbrook, Plumstead, Gravesend*
- Sepedon spinipes, Scop. *Blackbeath*
- sphegeus, Fab. *Old Charlton, Darentb, Maidstone*

PSILIDÆ

- Chyliza leptogaster, Panz. *Bearsted*

MICROPEZIDÆ

- Micropeza corrigiolata, Linn. *Bearsted*

ORTALIDÆ

- Dorycera graminum, Fab. *Gravesend*
- Ptilonota centralis, Fab. *Darentb*
- Pteropæctria nigrina, Mg. *Bearsted*
- frondescentiæ, Linn. *Fawley*
- Ceroxys picta, Mg. *Gravesend*
- omissa, Mg. "
- Anacampta urticæ, Linn. *Gravesend, Belvedere*
- Platystoma seminationis, Fab. *Folkestone, Maidstone*
- Rivellia syngenesiæ, Fab. *North Cray (Curtis)*
- Scoptera vibrans, Linn. *Bearsted, Belvedere*
- Ulidia erythrophthalma, Mg. *Bearsted*
- Chrysomya demandata, Fab. *Old Charlton*

TRYPETIDÆ

- Acidia heraclei, Linn. *Old Charlton, Blackbeath, Belvedere*

TRYPETIDÆ (continued)

- Spilographa zoë, Mg. *Lewisham, Maidstone*
- Trypeta cornuta, Fab. *Sittingbourne (Curtis)*
- onotrophes, Lw. *Lewisham*
- Urophora stylata, Fab. *Herne Bay*
- Carpotricha guttularis, Mg. *Herne Bay, Lewisham*
- Tephritis miliaria, Schrk. *Catford*

LONCHÆIDÆ

- Palloptra ustulata, Fln. *Maidstone*
- angelicæ v. Ros. "
- (Toxoneura) muliebris, Harr. *Blackbeath*

SAPROMYZIDÆ

- Peplomyza wiedemanni, Lw. *Blackbeath*
- Sapromyza lupulina, Fab. *Bearsted*
- fasciata, Fln. *Gravesend*
- pallidiventris, Fln. *Bearsted*
- obsoleta, Fln. *Blackbeath*
- difformis, Lw. *Maidstone*
- rorida, Fln. "
- præusta, Fln. "
- decipiens, Lw. *Bearsted*
- flaviventris, Costa. *St. Mary Cray*
- Lauxania ænea, Fln. *Barming (Elgar)*

OPOMYZIDÆ

- Opomyza germinationis, Linn. *Bearsted*
- Pelethophila flava, Linn. *Bearsted, Maidstone*

SEPSIDÆ

- Henicita annulipes, Mg. *Bexley (Curtis)*
- Sepsis pilipes, v. d. Wulp. *Abbey Wood*
- Piophila nigriceps, Mg. *Gravesend*

EPHYDRIDÆ

- Discomyza incurva, Fln. *St. Margaret's Bay*

CHLOROPIDÆ

- Eurina lurida, Mg. *Plumstead*
- Centor nudipes, Lw. *Bearsted*
- Chloropisca glabra, Mg. "
- Anthrachophaga frontosa, Mg. *Abbey Wood*
- Meromyza læta, Mg. *Lewisham*
- Camarota flavitarsis, Mg. *Bexley (Haliday, aurifrons)*

AGROMYZIDÆ

- Ochthiphila juncorum, Fln. *Bearsted*

PHYTOMYZIDÆ

- Chromatomyia obscurella, Fln. *Tunbridge Wells*

HIPPOBOSCIDÆ

- Hippobosca equina (?), Linn. *Maidstone (Elgar)*; very doubtful
- Ornithomyia avicularia, Linn. *Ramsgate*; on long-eared owl
- Stenopteryx hirundinis, Linn. *Malling, Larkfield*; on house martin (Elgar)

A HISTORY OF KENT

HEMIPTERA HETEROPTERA

Bugs

In this division of the Hemiptera the county is very well represented, 330 species having been recorded. Darenth Wood, Birch Wood and Deal are all historical hunting grounds, and have produced a great number of rarities. Three species only figure as peculiar to the county so far as records will allow me to judge, viz. *Eurygaster nigra*, Fab., *Jalla dumosa*, Lin., and *Aradus aterrimus*, D. & S. The first two have only occurred at Deal, the last one only at Darenth. Another Deal rarity, *Emblethis verbasci*, Fab., has only occurred elsewhere in the Scilly Islands, where Mr. Champion took it in some numbers. It is also abundant in Jersey.

GYMNOCERATA

PENTATOMIDÆ

- Odontoscelis*, Lap.
 - *fuliginosa*, Lin. *Deal* (Douglas and Scott, etc.)
- Corimelæna*, White
 - *scarabæoides*, Lin. *Deal* (Saunders), *Margate* (Billups), *Chatham*, *Darenth* (Champion), *Folkestone* (Rye), *Dodington*, etc. (Chitty)
- Eurygaster*, Lap.
 - *maura*, Lin. *Folkestone* (Douglas and Scott, etc.), *Deal* (Billups), *St. Margaret's Bay* (Newbery), *Chatham* (Champion), *Dover*, 'common by sweeping knapweed in August' (Hall)
 - *nigra*, Fab. *Deal* (Hall), *Margate* (Billups)
- Podops*, Lap.
 - *inuncta*, Fab. Generally distributed
- Sehirus*, Am. S.
 - *bicolor*, Lin. Generally distributed
 - *biguttatus*, Lin. Chalky lanes *Dover*, 'not common' (Hall), *Deal* (Billups), *Darenth*, *Chatham* (Champion), *Dodington* (Chitty)
 - *morio*, Lin. *Higham, Kent* (Billups)
- Gnathoconus*, Fieb.
 - *albomarginatus*, Fab. *Dover*, 'common by sweeping in lanes' (Hall), *Deal* (Billups, etc.), *Hythe* (Blatch), *Huntingfield* (Chitty), *Lee* (West)
 - *picipes*, Fall. *Bromley* (Saunders)
- Sciocoris*, Fall.
 - *cursitans*, Fab. *Deal* (Douglas and Scott, etc.)
- Ælia*, Fab.
 - *acuminata*, Lin. *Darenth Wood* (Douglas and Scott), *Huntingfield* (Chitty), *Bickley* (Jennings)

PENTATOMIDÆ (continued)

- Neottiglossa*, Curt.
 - *inflexa*, Wolff. Generally distributed
- Eysarcoris*, Hahn.
 - *melanocephalus*, Fab. *Darenth Wood* (Douglas and Scott), *Chatham* (Champion), *Tonbridge* (Blatch), *Dodington* (Chitty), *Tunbridge Wells* (Billups), *Farleigh*, *Bredhurst*, *Birling* (Elgar), *Hawkhurst* (Butler)
 - *æneus*, Scop. *Faversham* (J. J. Walker)
- Pentatoma*, Oliv.
 - *baccarum*, Lin. *Cliffs, Dover* (Hall), *Bickley* (Jennings), *Dodington* (Chitty)
 - *prasina*, Lin. *Bromley*, bred from larvæ beaten from ivy (West), *Maidstone* (Elgar), *Herne Bay* (Butler), *Huntingfield* (Chitty)
- Piezodorus*, Fieb.
 - *litratus*, Fab. *Dover* (Hall), *Plumstead*, *Brockley*, *Abbey Wood* (West), *Malling* (Elgar)
- Tropicoris*, Hahn.
 - *rufipes*, Lin. *Dover* district 'generally distributed' (Hall), *Shooters Hill* (West), *Huntingfield* (Chitty)
- Strachia*, Hahn.
 - *festiva*, Lin. *Lee* (Douglas and Scott), *Kingswood*, near *Maidstone*, *Oaken Wood*, *Barming* (Elgar), *Dodington* (Chitty)
 - *oleracea*, Lin. *Cliffs, Dover* (Hall), *Deal* (Saunders), *Huntingfield* (Chitty)
- Picromerus*, Am. S.
 - *bidens*, Lin. *Folkestone* on ragwort (West), *Boxley* (Elgar), *Deal* (Newbery)
- Podisus*, H.S.
 - *luridus*, Fab. *Darenth* (Champion), *Abbey Wood* (West)
- Jalla*, Hahn.
 - *dumosa*, Lin. Larva, *Deal* (Saunders)

INSECTS

PENTATOMIDÆ (continued)

- Zicrona, Am. S.
- cœrulea, Lin. *Chatham, Canterbury, Higham* (Champion)

ACANTHOSOMIDÆ

- Acanthosoma, Curt.
- hæmorrhoidale, Lin. *Deal* (Hall), *Abbey Wood, Lewisham* (West), *Barming* (Elgar), *Dodington* (Chitty)
- dentatum, De G. *Plumstead* (Billups), *Shooters Hill*, on oaks (West)
- interstinctum, Lin. *Shooters Hill*, on birches (West), *Herne Bay* (Butler), *Dodington* (Chitty)

COREIDÆ

- Enoplops, Am. S.
- scapha, Fab. *Folkestone* (Douglas and Scott), *St. Margaret's Bay* (Hall, etc.), *Sandwich* (Billups), *Dover* (Newbery)
- Syromastes, Latr.
- marginatus, Lin. *Dover* (Hall), *Deal*, *Blean Woods* (Chitty)
- Verlusia, Spin.
- rhombea, Lin. *Deal* (Douglas), *Darenth* (Champion)
- Pseudophlæus, Burm.
- fallenii, Schill. *Deal* (Douglas and Scott, etc.)
- Bathysolen, Fieb.
- nubilus, Fall. *Deal* (Scott)
- Ceraleptus, Cost.
- lividus, Stein. *Deal* (Power, etc.), *Chattenden* (Champion)
- Coreus, Fab.
- denticulatus, Scop. *Darenth, Folkestone, Eltham* (Douglas and Scott, etc.), *Plumstead* (Champion), *Tonbridge* (Blatch), *Margate* (Billups), *Lee* (West), *Deal* (Newbery), *Dodington* (Chitty)
- Alydus, Fab.
- calcaratus, Lin. *Plumstead Common, Folkestone* (Douglas and Scott)
- Stenocephalus, Latr.
- agilis, Scop. *Folkestone* (Hall), *Darenth* (Champion), *Oaken Wood, Barming* (Elgar)
- Corizus, Fall.
- crassicornis, Lin. *Deal* (Champion)
- maculatus, Fieb. *Sandwich* (Billups)
- capitatus, Fab. *Sheppey, Chatham* (Champion), *Herne Bay* (Saunders, etc.), *Oaken Wood, Barming* (Elgar), *Huntingfield* (Chitty)
- parumpunctatus, Schill. *Deal* (Douglas and Scott), *Chatham* (Champion), *Huntingfield* (Chitty), *Abbey Wood* (West)

COREIDÆ (continued)

- Myrmus, Hahn.
- myriformis, Fall. *Dartford Brent* (Douglas and Scott), *Folkestone, Dover, Deal* (Hall), *Swalecliffe* (Butler), *Kidbrook* (West), *Dodington* (Chitty)
- Chorosoma, Curt.
- schillingi, Schml. *Deal* (Douglas and Scott, etc.), *Yarmouth* (J. C. Dale), *Margate* (Billups), *Swalecliffe Marsh* (Butler)

BERYTIDÆ

- Neides, Latr.
- tipularius, Lin. *Deal, Folkestone* (Douglas and Scott)
- Berytus, Fab.
- clavipes, Fab. *Darenth Wood, Folkestone* (Douglas and Scott), *Whitstable* (Champion)
- minor, H.S. *Deal, Charlton* (Douglas and Scott), *Lee* (West)
- signoreti, Fieb. *West Wickham Wood, Deal* (Douglas and Scott), *Dover* (Hall)
- montivagus, Fieb. *Folkestone, Charlton* (Douglas and Scott), *Sheppey, Chatham* (Champion), *Dodington* (Chitty)
- crassipes, H.S. *Bexley* (Douglas and Scott)
- Metacanthus, Cost.
- punctipes, Germ. *Folkestone, Deal* (Douglas and Scott)

LYGÆIDÆ

- Lygæus, Fab.
- equestris, Lin. *St. Margaret's Bay* (Hall)
- Nysius, Dall.
- lineatus, Cost. *Plumstead* (West)
- thymi, Wolff. *Deal* (Douglas and Scott, etc.), *Swalecliffe*, abundant (Butler)
- Cymus, Hahn.
- glandicolor, Hahn. *Lee* (Douglas and Scott), *Grove Park* (West)
- clavivulus, Fall. *Deal, Dartford, Lewisham* (Douglas and Scott), *Plumstead marshes* (West)
- Ischnorhynchus, Fieb.
- resedæ, Panz. *Deal* (Butler), *Darenth* (Champion), *Dodington* (Chitty)
- geminatus, Fieb. *Plumstead* (West)
- Ischnodemus, Fieb.
- sabuleti, Fall. *Folkestone* (Lewis)
- Henestaris, Spin.
- laticeps, Curt. *Deal* (Billups)
- halophilus, Burm. *Hampton, near Herne Bay* (Saunders), *Whitstable, Sheppey* (Champion), *Swalecliffe* (Butler), *Dodington* (Chitty)
- Chilacis, Fieb.
- typhæ, Perr. *Deal*

A HISTORY OF KENT

LYGÆIDÆ (continued)

- Heterogaster, Schill.
 — urticæ, Fab. *Deal, Charlton* (Douglas and Scott), *Abbey Wood* (West)
 Rhyparochromus, Curt.
 — antennatus, Schill. *Sheerness, Whitstable, Chatham* (Champion), *Herne Bay* (Saunders)
 — prætextatus, H.S. *Deal* (Douglas and Scott, etc.).
 — dilatatus, H.S. *Deal* (Billups), *Shooters Hill, Blackheath* (West), near *Faversham* (Chitty)
 — chiragra, Fab. *Deal* (Billups), *Herne Bay* (Saunders), *Dodington* (Chitty)
 Ischnocoris, Fieb.
 — angustulus, Boh. *Dartford, Tunbridge Wells* (Douglas and Scott)
 Macrodera, Fieb.
 — micropterum, Curt. *Plumstead, Tunbridge Wells* (Douglas and Scott)
 Pionosomus, Fieb.
 — varius, Wolff. *Sandwich* (Curtis, etc.), *Deal* (J. J. Walker)
 Plinthisus, Fieb.
 — brevipennis, Latr. *Deal, Dartford Heath* (Douglas and Scott), *Sheerness, Sheppey, Chatham* (Champion), *Dodington* (Chitty), *Folkestone* (West), *Dover* (Hall)
 Lasiosomus, Fieb.
 — enervis, H.S. *Chatham* (Champion), *Huntingfield* (Chitty)
 Acompus, Fieb.
 — rufipes, Wolff. *Snodland, Chatham* (Champion)
 Stygnus, Fieb.
 — rusticus, Fall. *Lee, Beckenham* (Douglas and Scott), *Swalecliffe* (Butler)
 — pedestris, Fall. *Dartford Brent* (Douglas and Scott), *Deal, Dover* (Hall), *Tolehurst* (Chitty), *Lee* (West)
 — arenarius, Hahn. *Deal, Dover* (Hall), *Lee* (West), *Swalecliffe* (Butler), *Dodington* (Chitty)
 Peritrechus, Fieb.
 — geniculatus, Hahn. *Lee* (West), *Swalecliffe* (Butler), *Bickley* (Jennings)
 — nubilus, Fall. *Dartford* (Douglas and Scott), *Whitstable, Deal, Southend* (Champion), *Herne Bay* (Saunders), *Swalecliffe* (Butler)
 — luniger, Schill. *Darenth, Bexley* (Douglas and Scott), *Deal* (Saunders), *Dover* (Hall), *Shooters Hill* (West), *Hothfield Heath* (Elgar)
 Trapezonotus, Fieb.
 — distinguendus, Flor. *Whitstable* (Champion), *Dodington* (Chitty)

LYGÆIDÆ (continued)

- Trapezonotus agrestis, Panz. *Deal* (Douglas and Scott), *Darenth Wood* (Douglas), *Swalecliffe* (Butler), *Dodington* (Chitty)
 Aphanus, Lap.
 — rolandri, Lin. *Darenth* (Douglas and Scott), *Dartford, Plumstead* (Champion)
 — lynceus, Fab. *Dartford Heath* (Scott), *Deal* (Douglas, etc.).
 — pedestris, Panz. *Lee* (Douglas and Scott, etc.), *Ashford* (Marshall), *Gravesend*
 — pini, Lin. *Chatham, Darenth* (Champion), *Dodington* (Chitty)
 Emblethis, Fieb.
 — verbasci, Fab. *Deal*
 Eremocoris, Fieb.
 — fenestratus, H.S. *Chatham* (Champion)
 Drymus, Fieb.
 — pilicornis, M. & R. *Sheppey* (Champion)
 — sylvaticus, Fab. *Dover* (Hall), *Lee* (West), *Deal* (Newbery), *Swalecliffe* (Butler), *Dodington* (Chitty)
 — brunneus, Sahlb. *Dodington* (Chitty)
 — piceus, Flor. *Broadwater Forest, Tunbridge Wells* (Saunders)
 Notochilus, Fieb.
 — contractus, H.S. Generally distributed
 Scolopostethus, Fieb.
 — affinis, Schill. *Dover district*, common (Hall); *Lee, Lewisham, Kidbrook, West Wickham Wood* (West), *Huntingfield* (Chitty)
 — grandis, Horv. *Tunbridge Wells* (Saunders)
 — neglectus, Edw. *Dover* (Hall), *Lee, Lewisham, Kidbrook* (West), *St. Margaret's Bay* (Saunders)
 — decoratus, Hahn. *Dover* (Hall), *Plumstead* (West), *Tolehurst* (Chitty)
 Gastroles, Westw.
 — ferrugineus, Lin. *Birch Wood* (Marshall)

TINGIDIDÆ

- Picsma, Lap.
 — quadrata, Fieb. *Plumstead Marshes* (West), *Dover, St. Radegunds* (Newbery), *Swalecliffe* (Butler)
 — capitata, Wolff. *Lee, Bickley* (Douglas and Scott), *Dover* (Hall), *Deal* (Newbery), *Dodington* (Chitty)
 Serenthia, Spin.
 — læta, Fall. *Deal, Tunbridge Wells* (Douglas and Scott), *Herne Bay* (Saunders), *Sheppey, Whitstable* (Champion)
 Campylostira, Fieb.
 — verna, Fall. *Chatham* (Champion)

INSECTS

TINGIDIDÆ (continued)

Acalypta, West.

— brunnea, Germ. *Darenth Wood* (Douglas and Scott)

— parvula, Fall. *Dover* district, 'abundant' (Hall), *Deal* (Newbery), *Whitstable* (Butler), *Bickley* (Jennings), *Dodington* (Chitty)

Dictyonota, Curt.

— crassicornis, Fall. *Eltham, Plumstead* (Douglas and Scott), *Deal* (Hall), *Dover* (Newbery), *Dodington* (Chitty), *Swalecliffe* (Butler)

— strichnocera, Fieb. *Dartford Brent* (Douglas and Scott), *Blackheath* (West)

— fuliginosa, Costa. *Plumstead* (West), *Maidstone* (Elgar)

Derephysia, Spin.

— foliacea, Fall. *Blackheath* (West), *Dover* (Newbery), *Herne Bay* (Butler), *Dodington* (Chitty), *Bickley* (Jennings)

Monanthia, Lep.

— ampliata, Fieb. *Lee, Chislehurst* (Douglas and Scott), *Chatham* (Champion), *Kidbrook* (West)

— cardui, Lin. *Dover, Deal* (Hall), *Kidbrook* (West), *Swalecliffe* (Butler)

— ciliata, Fieb. *Dodington* (Chitty)

— costata, Fab. *Tunbridge Wells* (Champion), *Folkestone* (Rye), *Margate, Deal* (Billups), *Chatham* (West)

— dumetorum, H.S. *Lee* (Douglas and Scott), *Swalecliffe* (Butler), *Darenth* (Champion)

— simplex, H.S. *Bexley* (Scott), *Folkestone, Darenth, Chatham* (Champion)

— humuli, Fab. *Lee* (Douglas and Scott)

ARADIDÆ

Aradus, Fab.

— depressus, Fab. *Bromley* (Saunders), *Darenth Wood* (Marshall), *Tonbridge* (Blatch), *Dodington* (Chitty), *Chatham, Sevenoaks* (Champion)

— corticalis, Lin. *West Wickham* (Douglas and Scott)

— aterrimus, D. & S. *Darenth Wood* (Douglas and Scott)

Aneurus, Curt.

— lævis, Fab. *Bromley* (Saunders), *Darenth Wood* (Marshall), *Chatham* (Champion)

HEBRIDÆ

Hebrus, Curt.

— pusillus, Fall. *Plumstead Marshes* (Douglas and Scott)

HYDROMETRIDÆ

Hydrometra, Latr.

— stagnorum, Lin. *Dover* (Hall), *Catford* (West), *Tolehurst* (Chitty)

HYDROMETRIDÆ (continued)

Microvelia, West.

— pygmæa, Duf. *Plumstead Marshes* (Douglas and Scott), *Grove Park, Lee* (West)

Velia, Latr.

— currens, Fab. *Dover* (Hall), *Lee, Catford* (West), *Allington* (Elgar)

Gerris, Fab.

— paludum, Fab. *Eltham*

— najas, De G. *Catford* (West)

— thoracica, Schum. *Dover* (Hall), *Plumstead Marshes* (West), *Sandwich* (Newbery)

— gibbifera, Schum. *Lee, Catford* (West)

— lacustris, Lin. *Lee, Catford* (West), *Swalecliffe* (Butler)

— odontogaster, Zett. *Lee* (West), *Folkestone Warren* (Newbery)

— argentata, Schum. *Catford* (West)

REDUVIIDÆ

Ploiaria, Scop.

— vagabunda, Lin. *Lee* (Douglas and Scott), *Blackheath* (West), *Swalecliffe* (Butler)

Reduvius, Fab.

— personatus, Lin. *Deal, Dover* (Hall), *Maidstone, Boxley* (Elgar)

Coranus, Curt.

— subapterus, De G. *Deal* (Douglas and Scott, etc.)

Prostemma, Lap.

— guttula, Fab. *Sandwich, 1837* (Kennedy), *Charlton* (Janson)

Nabis, Latr.

— brevipennis, Hahn. *Darenth* (Marshall), *Bromley* (Saunders), *Dover* (Hall), *Lee* (West)

— lativentris, Boh. *Dover* (Hall), *Lee* (West), *Kingsdown* (Newbery)

— major, Cost. *Dover* (Hall), *Lee, Lewisham, Kidbrook* (West), *Deal* (Newbery), *Swalecliffe* (Butler)

— flavomarginatus, Scholtz. *Deal, Herne Bay* (Saunders), *Swalecliffe Marsh, Whitstable* (Butler), *Kidbrook* (West)

— limbatus, Dahlb. *Dover* (Hall), *Kidbrook* (West), *Deal* (Newbery), *Swalecliffe* (Butler)

— lineatus, Dahlb. *Herne Bay* (Saunders, etc.)

— ferus, Lin. *Dover* (Hall), *Kidbrook* (West), *Deal* (Newbery), *Swalecliffe* (Butler)

— rugosus, Lin. *Dover* (Hall), *Lee, Lewisham, Plumstead* (West), *Maidstone* (Elgar)

— ericetorum, Scholtz. *Dover* (Hall), *Plumstead* (West)

A HISTORY OF KENT

SALIDIDÆ

- Salda*, Fab.
 — *pilosa*, Fall. *Sandwich* (Curtis), *Pegwell Bay* (Saunders), *Margate* (Billups), *Sheppey* (Champion)
 — *saltatoria*, Lin. *Lee* (West), *Deal* (Newbery)
 — *pallipes*, Fab. *Deal* (Douglas and Scott)
 — *pilosella*, Thoms. *Gravesend*, *Margate* (Billups), *Deal* (Newbery), *Whitstable* (Butler)
 — *orthochila*, Fieb. *Tunbridge Wells* (Saunders)
 — *littoralis*, Lin. *Deal*, *Sheerness* (Douglas and Scott), *Whitstable* (Butler)
 — *lateralis*, Fall. *Deal* (Douglas and Scott), *Sheppey*, *Whitstable* (Champion, etc.), *Margate* (Billups), *Pegwell Bay* (Saunders)
 — *cincta*, H.S. *Lee*, *Eltham* (Douglas and Scott, etc.)

CIMICIDÆ

- Ceratocombus*, Sign.
 — *coleopratus*, Zett. *Bexley* (Champion)
Cimex, Lin.
 — *lectularius*, Lin. *Dover*, 'perhaps rarer than in some towns' (Hall); *Greenwich* (West); possibly occurs elsewhere but not recorded (E.S.)
Lyctocoris
 — *campestris*, Fall. *Dover* (Hall), *Kidbrook* (West), *Swalecliffe* (Butler)
Piezostethus, Fieb.
 — *galactinus*, Fieb. *Lewisham* (West), *Swalecliffe* (Butler)
Temnostethus, Fieb.
 — *pusillus*, H.S. *Darent Wood*, *Tunbridge Wells* (Douglas and Scott), *Swalecliffe* (Butler)
Anthocoris, Fall.
 — *confusus*, Reut. *Darent* (Champion), *Blackheath*, *Lee*, *Lewisham* (West)
 — *nemoralis*, Fab. *Dover* district, abundant (Hall), *Blackheath*, *Lee*, *Lewisham* (West)
 — *sarothamni*, D. & S. *Lee* (Billups)
 — *sylvestris*, Lin. *Dover* district, abundant (Hall), *Swalecliffe* (Butler)
 — *gallarum ulmi*, De G. *Kidbrook* (West), *St. Radegunds* (Newbery)
Tetraphleps, Fieb.
 — *vittata*, Fieb. *Darent Wood* (Billups), *Bostol Wood*, *Plumstead* (West)
Acompocoris, Reut.
 — *pygmaeus*, Fall. *Bostol Wood*, *Plumstead* (West)
Triphleps, Fieb.
 — *nigra*, Wolff. *Tunbridge Wells*, *Herne Bay* (Saunders), *Plumstead* (West)

CIMICIDÆ (continued)

- Triphleps majuscula*, Reut. *Herne Bay* (Saunders), *Deal* (Billups), *Lewisham* (West), *Swalecliffe* (Butler)
 — *minuta*, Lin. *Lee*, *Plumstead Common* (Douglas and Scott), *Deal* (Hall)
Cardiastethus, Fieb.
 — *fasciiventris*, Garb. *Sheppey* (Champion)
Xylocoris, Duf.
 — *ater*, Duf. *Sittingbourne* (Champion)
Microphysa, Westw.
 — *pselaphiformis*, Curt. *Lee*, *Darent* (Douglas and Scott), *Bromley*, *Tunbridge Wells* (Saunders)
 — *elegantula*, Baer. *Tunbridge Wells* (Saunders)
Myrmedobia, Baer.
 — *distinguenda*, Reut. *Swalecliffe* (Butler)

CAPSIDÆ

- Pithanus*, Fieb.
 — *mærkeli*, H.S. *Eltham* (Douglas and Scott), *Dover* (Hall), *Lee* (West), *Deal* (Newbery), *Dodington*, etc. (Chitty), *Swalecliffe* (Butler)
Acetropis, Fieb.
 — *gimmerthalii*, Flor. *Birch Wood* (Power), *Deal* (Dale), *Kidbrook* (West)
Miris, Fab.
 — *calcaratus*, Fall. *Lewisham*, *Darent* (Douglas and Scott), *Folkestone*, *Deal* (West)
 — *lævigatus*, Lin. Generally distributed
Megaloceræa, Fieb.
 — *erratica*, Lin. *Dover*, etc. (Hall), *Kidbrook*, *Lee*, *Lewisham* (West), *Littlestone* (Elgar), *Dodington* (Chitty), *Deal*, *Swalecliffe* (Butler)
 — *longicornis*, Fall. *Lee*, *Bexley*, *Dartford* (Douglas and Scott), *Dover* (Hall), *Folkestone* (West)
 — *ruficornis*, Fourc. *Dartford*, *Charlton* (Douglas and Scott), *Dover* (Hall), *Kidbrook*, *Lee* (West), *Dodington*, etc. (Chitty), *Swalecliffe* (Butler)
Teratocoris, Fieb.
 — *antennatus*, Boh. *Hampton near Herne Bay* (Butler), *Sheppey* (Champion)
 — *saundersi*, D. & S. *Whitstable* (Butler), *Deal* (Saunders)
Leptopterna, Fieb.
 — *ferrugata*, Fall. *Eltham* (Douglas and Scott), *Dover* (Hall), *Folkestone*, *Kidbrook* (West)
 — *dolabrata*, Lin. *Lee*, *Eltham* (Douglas and Scott), *Kidbrook*, *Shooters Hill* (West), *Huntingfield* (Chitty)
Monalocoris, Dahlb.
 — *filicis*, Lin. *Plumstead* (West), *Bromley* (Saunders), *Tolehurst* (Chitty)

INSECTS

CAPSIDÆ (continued)

- Bryocoris, Fall.
- pteridis, Fall. *Tunbridge Wells* (Douglas and Scott)
- Pantilius, Curt.
- tunicatus, Fab. *Darenth Wood* (Douglas and Scott), *Bromley* (Saunders), *Dover* (Hall), *Abbey Wood* (West), *Huntingfield* (Chitty)
- Lopus, Hahn.
- gothicus, Lin. *Birch Wood* (Marshall)
- flavomarginatus, Don. *Halfway Street* (Douglas and Scott), *Abbey Wood* (West), *Blean Woods* (Chitty)
- Miridius, Fieb.
- quadrivirigatus, Costa. *Deal* (Douglas and Scott, etc.), *Sheppey* (Champion), *Dover* (Hall), *Swalecliffe* (Butler)
- Phytocoris, Fall.
- populi, Lin. *Blackbeath* (Douglas and Scott), *Dover* (Hall)
- tilia, Fab. *Dover* (Hall), *Blackbeath, Lee, Lewisham* (West)
- longipennis, Flor. *Blackbeath* (Douglas and Scott), *Abbey Wood* (West)
- dimidiatus, Kb. *Darenth Wood* (Douglas and Scott), *Hither Green, Lee* (West)
- reuteri, Saund. *Dartford Brent* (Douglas and Scott), *Blackbeath, Kidbrook* (West)
- varipes, Boh. *Dover* (Hall), *Folkestone* (West), *Boxley* (Elgar), *Herne Bay* (Saunders)
- ulmi, Lin. *Darenth* (Douglas and Scott), *Dover* (Hall), *Lee, Lewisham* (West), *Herne Bay* (Saunders)
- Calocoris, Fieb.
- striatellus, Fab. *Lewisham, Bexley, Darenth Wood* (Douglas and Scott), *Shooters Hill* (West), *Chattenden* (Chitty), *Tunbridge Wells* (Saunders)
- fulvomaculatus, De G. *Darenth* (Douglas and Scott), *Dover* (Hall), *Abbey Wood* (West)
- bipunctatus, Fab. *Dover district* (Hall), *Lee, Lewisham* (West), *Barming* (Elgar), *Herne Bay* (Saunders), *Swalecliffe* (Butler)
- chenopodii, Fall. *Dover district* (Hall), *Lee* (West), *Herne Bay* (Saunders), *Swalecliffe* (Butler), *Huntingfield* (Chitty)
- roseomaculatus, De G. *Darenth, Folkestone* (Douglas and Scott), *Kingdown* (Hall), *Huntingfield* (Chitty)
- marginellus, Fab. *Charing, Kent*, 'rare' (Marshall)
- infusus, H.S. *Lewisham* (Douglas and Scott), *Lee, Greenwich Park* (West), *Bromley* (Saunders)

CAPSIDÆ (continued)

- Calocoris striatus, Lin. *Darenth Wood, Tunbridge Wells* (Douglas and Scott), *Plumstead* (West), *Chattenden Roughs* (Chitty)
- Oncognathus, Fieb.
- binotatus, Fab. *Bexley, Darenth* (Douglas and Scott), *Dover* (Hall), *Huntingfield* (Chitty)
- Dichroscytus, Fieb.
- rufipennis, Fall. *Dartford Heath* (Douglas and Scott)
- Plesiocoris, Fieb.
- rugicollis, Fall. *Deal* (Saunders), *Plumstead* (West)
- Lygus, Hahn.
- pratensis, Fab. Generally distributed
- rubricatus, Fall. *Bromley* (Saunders), *Darenth* (Champion), *Dover* (Hall)
- contaminatus, Fall. *Darenth, Dartford* (Douglas and Scott), *Dover* (Hall), *Lewisham, West Wickham Wood* (West), *Sevenoaks* (Butler)
- viridis, Fall. *Darenth* (Douglas and Scott), *Dover* (Hall), *Blackbeath* (West)
- lucorum, Mey. *Dover* (Hall)
- spinolæ, Mey. *Eltham* (Douglas and Scott), *Bromley* (Saunders), *Sevenoaks* (Butler), *Dover* (Hall)
- pabulinus, Lin. *Tunbridge Wells* (Douglas and Scott), *Dover* (Hall), *Lee, Lewisham* (West), *Dodington, Tolehurst* (Chitty)
- viscicola, Put. *Dodington* (Chitty)
- pastinacæ, Fall. *Strood* (Douglas and Scott), *Abbey Wood* (West), *Swalecliffe* (Butler)
- cervinus, H.S. *Blackbeath* (West), *Swalecliffe* (Butler)
- kalmii, Lin. *Dover* (Hall), *Deal* (Newbery)
- Zygmus, Fieb.
- pinastri, Fall. *Bromley* (Saunders), *Bostol Wood, Plumstead* (West)
- Pœciloscytus, Fieb.
- gyllenhalii, Fall. *Dover* (Hall), *Kingdown* (Newbery)
- nigratus, Fall. *Deal* (Billups), *Dover* (Hall), *Darenth* (Chitty)
- unifasciatus, Fab. *Lee, Folkestone* (Douglas and Scott), *Dover* (Hall)
- Camptobrochis, Fieb.
- lutescens, Schill. *Bromley* (Saunders), *Dover* (Hall), *Blackbeath, Plumstead, Lee, West Wickham Wood* (West)
- Liocoris, Fieb.
- tripustulatus, Fab. *Dover* (Hall), *Kidbrook, Lee, Lewisham* (West), *Dodington, etc.* (Chitty)

A HISTORY OF KENT

CAPSIDÆ (continued)

- Capsus, Fab.
 — lanarius, Lin. *Dover* (Hall), *Lee*, *Lewisham* (West), *Maidstone* (Elgar)
 — scutellaris, Fab. *Dartford Heath* (Douglas and Scott)
Bothynotus, Fieb.
 — pilosus, Boh. Between *Herne Bay* and *Canterbury* one ♀ (Butler)
Rhopalotomus, Fieb.
 — ater, Lin. *Dover* (Hall), *Lee*, *Lewisham*, *Kidbrook* (West), *Harrietsham*, *Barming* (Elgar), *Dodington* (Chitty)
Pilophorus, Hahn.
 — cinnamopterus, Kb. *Firs* between *Herne Bay* and *Canterbury* (Butler), *Plumstead* (Douglas and Scott)
 — perplexus, Scott. *Lewisham* (Douglas and Scott), *Bromley* (Saunders), *Deal* (Hall), *Blackheath* (West), *Swalecliffe* (Butler)
 — clavatus, Lin. *Lee* (Douglas and Scott)
Systellonotus, Fieb.
 — triguttatus, Lin. *Dover* (Hall)
Allodapus, Fieb.
 — rufescens, Burm. *Plumstead* (Douglas and Scott), *Swalecliffe Marsh* (Butler)
Halticus, Burm.
 — luteicollis, Panz. *Strood* (Douglas and Scott), *Bromley* (Saunders)
 — apterus, Lin. *Darenth* (Douglas and Scott), *Herne Bay* (Saunders)
Orthocephalus, Fieb.
 — saltator, Hahn. *Eltham*, *Folkestone* (Douglas and Scott), *Brockley* (West), *Deal* (Newbery), *Dodington*, etc. (Chitty)
Macrolophus, Fieb.
 — nubilus, H.S. *Lewisham* (Douglas and Scott), *Tunbridge Wells* (Saunders), *West Wickham Wood* (West)
Dicyphus, Fieb.
 — epilobii, Reut. *Folkestone*, *Lewisham* (Douglas and Scott), *Dover* (Hall), *Kidbrook* (West), *Sandwich* (Newbery)
 — errans, Wolff. *Lewisham*, *Eltham*, *Darenth* (Douglas and Scott), *Abbey Wood* (West)
 — stachydis, Reut. *Dover* (Hall), *Dodington* (Chitty)
 — pallidicornis, Fieb. *Plumstead*, *Darenth*, *Tunbridge Wells* (Douglas and Scott), *Abbey Wood* (West)
 — globulifer, Fall. *Lewisham*, *Eltham*, *Bexley* (Douglas and Scott), *Abbey Wood* (West), *Dodington* (Chitty)
 — annulatus, Wolff. *Deal*, *Folkestone* (Douglas and Scott), *Herne Bay* (Saunders)

CAPSIDÆ (continued)

- Campyloneura*, Fieb.
 — virgula, H.S. *Wickham*, *Bromley*, *Bexley* (Douglas and Scott), *Dover* (Hall), *Blackheath*, *Lee* (West), *Dodington* (Chitty)
Cyllocoris, Hahn.
 — histrionicus, Lin. *Darenth Wood* (Douglas and Scott), *Dover* (Hall), *Abbey Wood* (West)
 — flavonotatus, Boh. *Lewisham* (Douglas and Scott), *Darenth* (Champion), *Shooters Hill Wood* (West), *Dodington* (Chitty)
Ætorhinus, Fieb.
 — angulatus, Fab. *Lewisham* (Douglas and Scott), *Dover* (Hall), *Blackheath*, *Lee* (West), *Dodington* (Chitty)
Globiceps, Latr.
 — flavomaculatus, Fab. *Eltham* (Douglas and Scott), *Dover* (Hall), *Dodington* (Chitty)
 — cruciatus, Reut. *Dartford Brent* (Douglas and Scott), *Deal* (Saunders)
Mecomma, Fieb.
 — ambulans, Fall. *Plumstead* (Douglas and Scott), *Abbey Wood*, *Grove Park*, *Lee* (West)
Cyrtorrhinus, Fieb.
 — caricus, Fall. *Tunbridge Wells* (Butler)
 — pygmæus, Zett. *Deal* (Butler), *Sandwich* (Billups)
 — flaveolus, Reut. *Whitstable* (Butler)
Orthotylus, Fieb.
 — bilineatus, Fall. *Plumstead*, *Shooters Hill* (West)
 — flavinervis, Kb. *Lewisham* (Douglas and Scott), *Bromley* (Saunders), *Forest Hill* (Champion), *Catford* (West)
 — marginalis, Reut. *Lewisham* (Douglas and Scott), *Lee* (West), *Tolehurst* (Chitty)
 — nassatus, Fab. *Eltham* (Douglas and Scott), *Bromley* (Saunders), *Blackheath* (West)
 — viridinervis, Kb. *Blackheath* (West)
 — prasinus, Fall. *Kidbrook* (West)
 — scotti, Reut. *Bromley* (Saunders)
 — ochrotrichus, D. & S. *Folkestone* (Douglas and Scott)
 — diaphanus, Kb. *Lee*, *Eltham* (Douglas and Scott), *Bromley* (Saunders), *Lewisham* (West)
 — flavosparsus, Sahlb. *Lee* (Douglas and Scott), *Pegwell Bay*, *Whitstable*, *Swalecliffe* (Butler), *Kidbrook*, *Lewisham* (West)
 — chloropterus, Kb. *Plumstead* (West)
 — concolor, Kb. *Tunbridge Wells* (Douglas and Scott)

INSECTS

CAPSIDÆ (continued)

- Orthotylus adenocarpi*, Perr. *Plumstead* (Billups)
 — *rubidus*, Fieb. & Put. *Pegwell Bay*, *Whitstable*, *Swalecliffe* (Butler), *Herne Bay* (Saunders)
 — *ericetorum*, Fall. *Plumstead*, *West Wickham Wood* (West), *Tolehurst* (Chitty)
Hypsitylus, Fieb.
 — *bicolor*, D. & S. *Blackbeath*, *Charlton* (Douglas and Scott)
Loxops, Fieb.
 — *coccinea*, Mey. *Abbey Wood* (West), *Sevenoaks* (Butler)
Heterotoma, Latr.
 — *merioptera*, Scop. *Eltham*, *Bexley*, *Darenth* (Douglas and Scott), *Dover* (Hall), *Kidbrook* (West), *Huntingfield* (Chitty)
Heterocordylus, Fieb.
 — *tibialis*, Hahn. *Dartford Heath*, *Birch Wood* (Douglas and Scott), *Plumstead* (West)
Malacocoris, Fieb.
 — *chlorizans*, Fall. *Bexley* (Douglas and Scott), *Lee*, *Lewisham* (West)
Onychmenus, Reut.
 — *decolor*, Fall. *Eltham*, *Dartford Brent* (Douglas and Scott), *Tunbridge Wells*, *Deal* (Butler), *Dover* (Hall), *Huntingfield* (Chitty)
Oncotylus, Fieb.
 — *viridiflavus*, Goeze. *Hurst Wood*, *Tunbridge Wells* (Douglas and Scott), *Sevenoaks* (Butler)
Macrotylus, Fieb.
 — *paykulli*, Fall. *Folkestone* (Douglas and Scott), *Dover* (Hall)
Conostethus, Fieb.
 — *salinus*, J. Sahlb. *Gravesend* (Power)
 — *roseus*, Fall. *Eltham* (Douglas and Scott)
Hoplomachus, Fieb.
 — *thunbergi*, Fall. *Birch Wood* (Power), *Darenth Wood* (Billups), *Boxley Hills* (Marshall)
Macrocoleus, Fieb.
 — *hortulanus*, Mey. *Darenth Wood*
 — *molliculus*, Fall. *Folkestone*, *Lee* (Douglas and Scott), *Dover* (Hall), *Swalecliffe* (Butler)
Amblytylus, Fieb.
 — *affinis*, Fieb. *Eltham* (Douglas and Scott), *Tunbridge Wells* (Saunders), *Lee* (Billups), *Dover* (Newbery), *Dodington* (Chitty)
 — *brevicollis*, Fieb. *Shooters Hill* (West)
Harpocera, Curt.

CAPSIDÆ (continued)

- Harpocera thoracica*, Fall. *Lewisham*, *Eltham*, *Bexley* (Douglas and Scott), *Grove Park*, *Lee* (West), *Bromley* (Saunders), *Dodington* (Chitty)
Byrsoptera, Spin.
 — *rufifrons*, Fall. *Blackbeath*, *Tunbridge Wells* (Douglas and Scott), *Abbey Wood* (West), *Deal* (Newbery), *Dodington* (Chitty)
Phylus, Hahn.
 — *palliceps*, Fieb. *Darenth Wood* (Douglas and Scott), *Shooters Hill* (West), *Bromley* (Saunders), *Dodington* (Chitty)
 — *melanocephalus*, Lin. *Darenth Wood* (Douglas and Scott), *Dover* (Hall), *Shooters Hill* (West), *Bromley*, *Tunbridge Wells* (Saunders)
 — *coryli*, Lin. *Darenth Wood* (Douglas and Scott), *Dover* (Hall), *Shooters Hill* (West), *Tunbridge Wells* (Saunders)
Atractotomus, Fieb.
 — *mali*, Mey. *Catford* (West)
 — *magnicornis*, Fall. *West Wickham*, *Bromley* (Saunders), *Bostol Wood*, *Plumstead* (West)
Psallus, Fieb.
 — *ambiguus*, Fall. *Eltham* (Douglas and Scott), *Tunbridge Wells* (Saunders), *Kidbrook* (West)
 — *betuleti*, Fall. *Darenth* (Douglas and Scott), *Shooters Hill*, *West Wickham Wood* (West)
 — *obscurellus*, Fall. *Dartford Heath* (Douglas and Scott), *Bostol Wood*, *West Wickham Wood* (West), *Bromley* (Saunders)
 — *variabilis*, Fall. *Darenth* (Douglas and Scott), *Shooters Hill*, *West Wickham Wood* (West), *Tunbridge Wells* (Saunders)
 — *quercus*, Kb. *Darenth* (Douglas and Scott), *Bromley* (Saunders), *Shooters Hill*, *West Wickham Wood* (West)
 — *lepidus*, Fieb. *Dartford* (Douglas and Scott), *Abbey Wood* (West), *Bromley* (Saunders)
 — *alnicola*, D. & S. *Catford* (West)
 — *fallenii*, Reut. *Lewisham* (West)
 — *varians*, H.S. *Dover* (Hall), *Shooters Hill* (West), *Bromley*, *Tunbridge Wells* (Saunders)
 — *albicinctus*, Kb. *West Wickham* (?) (Chaney)
 — *sanguineus*, Fab. *Deal*, *Lewisham* (Douglas and Scott), *Lewisham*, *Folkestone* (West)
 — *salicellus*, Mey. *Wickham*, *Darenth*, *Tunbridge Wells* (Douglas and Scott), *Lee* (West), *Tolehurst* (Chitty)

A HISTORY OF KENT

CAPSIDÆ (continued)

- Psallus rotermundi*, Schltz. *Blackbeath* (Douglas and Scott), *Herne Bay* (Saunders)
Plagiognathus, Fieb.
 — *albipennis*, Fall. *Sheppey* (Champion), *Swalecliffe* (Butler), *Deal* (Billups), *Eltham*, *Lee* (Bignell)
 — *viridulus*, Fall. Generally distributed
 — *arbustorum*, Fab. " "
 — *roseri*, H.S. *Bromley* (Saunders), *Lewis-ham* (West)
 — *bohemanni*, Fall. *Deal* (Douglas and Scott, etc.)
 — *nigritulus*, Fall. *Deal* (Douglas and Scott, etc.)
 — *pulicarius*, Fall. *Deal* (Douglas and Scott, etc.), *Brockley* (West)
 — *saltitans*, Fall. *Deal* (Newbery)
Asciodema, Reut.
 — *obsoletum*, D. & S. *Blackbeath* (Douglas and Scott)

CRYPTOCERATA

NAUCORIDÆ

- Naucoris*, Geoffr.
 — *cimicoides*, Lin. *Dover* (Hall), *Plumstead Marsh*, *Ponds*, *Lee*, *Lewisham* (West), *Sheppey*, *Iwade*, *Deal* (Chitty)

NEPIDÆ

- Nepa*, Lin.
 — *cinerea*, Lin. *Iwade* (Chitty)
Ranatra, Fab.
 — *linearis*, Lin. *Lee*

NOTONECTIDÆ

- Notonecta*, Lin.

NOTONECTIDÆ (continued)

- Notonecta glauca*, Lin. *Dover* (Hall), *Plumstead Marsh*, *Lee*, *Catford* (West), *Swalecliffe* (Butler)
Plea, Leach.
 — *minutissima*, Fab. *Dover* (Hall), *Folkestone Warren* (Newbery), *Swalecliffe* (Butler), *Deal* (Chitty)

CORIXIDÆ

- Corixa*, Geoffr.
 — *geoffroyi*, Leach. *Deal* (Hall), *Lee* (West)
 — *atomaria*, Ill. *Gravesend* (Douglas and Scott), *Deal* (Hall), *Catford* (West), *Swalecliffe* (Butler)
 — *lugubris*, Fieb. *Gravesend* (Douglas and Scott), *Plumstead* (West), *Swalecliffe* (Butler)
 — *hieroglyphica*, Duf. *Deal* (Hall), *Lee*, *Catford* (West)
 — *sahlbergi*, Fieb. *Deal* (Hall), *Lee*, *Catford* (West)
 — *linnæi*, Fieb. *Deal* (Hall)
 — *limitata*, Fieb. *Lee* (West)
 — *semistriata*, Fieb. *Lee* (Douglas and Scott)
 — *striata*, Lin. *Deal* (Hall), *Lee*, *Catford* (West)
 — *fallenii*, Fieb. *Deal* (Hall), *Lee* (West)
 — *distincta*, Fieb. *Lewisham* (Douglas and Scott), *Lee* (West)
 — *mœsta*, Fieb. *Deal* (Hall)
 — *fabricii*, Fieb. *Deal* (Hall), *Lee* (West)
 — *præusta*, Fieb. *Lee* (West)
 — *concinna*, Fieb. *Lewisham* (Douglas and Scott), *Gravesend* (Champion)
 — *coleoprata*, Fab. *Whitstable* (Champion), *Folkestone* (Hall), *Lee* (West)

HEMIPTERA HOMOPTERA

Cicadas, *Fiend-flies*, *Lantern-flies*, *Frog-hoppers*, *Grass-flies*,
Aphides, etc.

CICADINA

- Centrotus cornutus*, Linn. *Abbey Wood*
Tettigometra impressopunctata, Sign. *Folkestone* (Douglas)
Issus coleoptratus, Geoffr. *Blackbeath*; beating ivy
Oliarus panzeri, Löw. *Kidbrook*, near *Blackbeath*, on elm; *Lee*, *Kent*, on willows; *Deal*, *Herne Bay*, *Bromley* (Saunders)
Cixius pilosus, Ol. *Lee*, on oaks; all three varieties equally common
 — *cunicularis*, Linn. *Crown Wood*, *Shooters Hill*
 var. *dionysii*. *West Wickham*; beating hazel

- Cixius nervosus*, Linn. *Wickham Wood*, on birch; *Lee*, on oak; *Kidbrook Lane*, on elm
 — *stigmaticus*, Germ. *Deal* (Douglas)
 — *brachycranus*, Fieb. *Catford*, on *Populus alba*; *Hurst Wood*, *Tunbridge Wells* (Douglas); *Herne Bay* (Saunders)
 — *scotti*, Edw. *Deal*; sweeping; *Tunbridge Wells* (Saunders)
 — *remotus*, Edw. *Deal* (Douglas)
Asiraca clavicornis, Fab. *Dartford* (Rye, Douglas and Scott)
Delphax pulchella, Curt. *Sandwich* (Marshall), *Lee* (Scott)
Liburnia vittipennis, J. Sahl.

INSECTS

Liburnia scotti, Fieb. *Sallow Pit, Lee and Abbey Wood Marshes* (Scott)
 — *unicolor*, H.S. *Plumstead Marshes*; common on reeds; *Herne Bay* (Saunders), *Seasalter* (Butler)
 — *signoreti*, Scott. *Abbey Wood* (Scott)
 — *capnodes*, Scott. *Lee* (Scott)
 — *scutellata*, Scott. *Darenth* (Marshall)
 — *pellucida*, Fab. *Lewisham, Plumstead, Blackheath, Brockley*; very common amongst grasses
 — *difficilis*, Edw. *Lee, Plumstead, Catford*; common sweeping grasses
 — *discolor*, Boh. *Abbey Wood*; sweeping
 — *forcipata*, Boh. *Grove Park, Lee*; sweeping
 — *discreta*, Edw. *Herne Bay* (Saunders)
 — *aubei*, Perris. " "
 — *fairmairei*, Perris. *Grove Park, Lee*; sweeping
 — *limbata*, Fab. *Kidbrook, Lee*; on rushes
 — *douglasi*, Scott. *Folkestone* (Douglas)
 — *lineata*, Perris. *Grove Park, Lee*; on grasses
Dicranotropis hamata, Boh. *Plumstead Marsh, Lee, Brockley*; sweeping
Stiroma pteridis, Boh. *Wickham Wood*; common on ferns, Macropterous form rare
 — *affinis*, Fieb. *Abbey Wood*; sweeping
Tricophora vulnerata, Illig. *Lee*, on willows; *Darenth Wood* (Curtis), *Herne Bay* (Butler)
Aphrophora alni, Fall. *Lewisham*, on alders and poplars
 — *salicis*, De G. *Lee*, on willows
Philænus spumarius, Linn. This well known species can be taken in abundance everywhere by sweeping, beating or searching almost any tree or plant
 — *campestris*, Fall. Very common on waste grounds. *Lee, Kidbrook*
 — *exclamationis*, Thunb. *Dover* (Dale)
 — *lineatus*, Linn. Abundant. *Blackheath, Lewisham, Brockley*, and many other places by sweeping
Ledra aurita, Linn. This fine species I have taken (♂ ♀) by beating oaks. *Wickham Wood*
Ulopa reticulata, Fab. *Plumstead*, on heath; *Darenth Wood* (Marshall)
Megophthalmus scanicus, Fall. *Abbey Wood, Brockley*; by sweeping; *Herne Bay* (Saunders)
Macropsis lanio, Linn. Very common beating oaks. *Shooters Hill Wood*
Bythoscopus alni, Schr. *Catford*, on alders; very common on hazel at *Grove Park, Lee*

Bythoscopus rufusculus, Fieb. *Lewisham*, on willows
 — *flavicollis*, Linn. *Shooters Hill, Wickham Wood*, on birch; all the varieties equally represented
Pediopsis tilia, Germ. This rare species I beat out of the common lime trees in *Wickham Wood*. Although reported on limes on the continent, I think there has been a doubt as to its food plant in this county. Mr. J. Edwards has also taken it on limes at *Cheltenham*
 — *scutellatus*, Boh. *Abbey Wood, Lee, Kidbrook*; on willows
 — *tibialis*, Scott. *Lee, Lewisham*; beating brambles; *Dartford Heath* (Scott)
 — *fuscinervis*, Boh. *Shooters Hill*; on aspens
 — *distinctus*, Scott. *Darenth* (Douglas)
 — *ulmi*, Scott. *Kidbrook*; on elm; very common on fences, *Blackheath*, during stormy weather
 — *cereus*, Germ. *Grove Park, Lee*; beating willows
 — *virescens*, Fab. *Lewisham*; on willows
Idiocerus adustus, H.S. *Plumstead, Blackheath, Catford*; on willows
 — *distinguendus*, Kbm. *Lee, Blackheath, Brockley*; common on *Populus alba*; *Lewisham* (Douglas)
 — *tremulæ*, Estl. *Shooters Hill*; on aspens
 — *laminatus*, Flor. *Plumstead*, on Lombardy poplars; *Shooters Hill*, on aspen
 — *litratus*, Fall. *Deal* (Butler)
 — *tibialis*, Fieb. *Darenth* (Douglas)
 — *vitreus*, Fab. *Blackheath, Brockley*; on Lombardy poplars
 — *fulgidus*, Fab. *Blackheath, Lewisham*; on poplars
 — *populi*, Linn. *Lewisham, Shooters Hill*; common on aspen
 — *confusus*, Flor. *Lewisham*; on willows
 — *albicans*, Kbm. *Blackheath, Brockley, Lee*; very common on *Populus alba*
Agallia puncticeps, Germ. *Plumstead* (Beaumont)
 — *venosa*, Fall. *Deal* (Marshall)
Evacanthus interruptus, Linn. *Bromley*; on nettles
 — *acuminatus*, Fab. *Abbey Wood, Wickham Wood*; on various bushes
Tettigonia viridis, Liv. *Lewisham*; on nettles
Acocephalus nervosus, Schr. *Lewisham, Lee, Kidbrook*, and many other places; very common amongst thistles

A HISTORY OF KENT

- Acocephalus albifrons*, Linn. *Blackbeath*; very common under furze bushes; *Whitstable* (Butler)
- *brunneo-bifasciatus*, Geoff. *Kidbrook, Blackbeath*; with *albifrons* under furze bushes; *Catford*; abundant at roots of grass; *Herne Bay* (Saunders)
- *histrionicus*, Fab. *Deal* (Marshall)
- *flavostriatus*, Don. *Catford*; at roots of grass; *Herne Bay* (Saunders)
- Eupelix cuspidata*, Fab. *Shooters Hill*; sweeping; *Deal* (Marshall)
- Graphocrocerus ventralis*, Fall. *Grove Park, Lee*; sweeping in meadows; *Abbey Wood* (Douglas and Scott)
- Doratura stylata*, Boh. *Greenwich*; at roots of grass; *Kidbrook, Lee*; sweeping
- Paramesus nervosus*, Fall. *Sandwich* (Marshall), *Herne Bay* (Butler)
- Stictocoris preyssleri*, H.S. *Plumstead*; sweeping; *Herne Bay* (Butler)
- *flaveolus*, Boh. *Kidbrook*; in damp places very common. This species is a recent addition to the British fauna (See *E. M. M.*, January, 1902)
- Athysanus sordidus*, Zett. *Catford*; at roots of grass abundant; *Blackbeath*; under furze bushes
- *grisescens*, Zett. *Shooters Hill*; in damp places
- *communis*, J. Sahl. *Lee, Lewisham, Shooters Hill, Deal*, on the sandhills, September; *Swalecliffe* (Butler)
- *obscurus*, Kbm. *Lee, Lewisham*, and many other places; sweeping
- *obsoletus*, Kbm. *Kidbrook, Shooters Hill, Lee, Deal* (Butler)
- Deltocephalus abdominalis*, Fab. *Elmers End*; sweeping along the roadsides
- *striifrons*, Kbm. *Herne Bay* (Saunders)
- *pascuellus*, Fall. *Lewisham* and district; abundant
- *ocellaris*, Fall. *Plumstead Marshes, Lewisham, Greenwich, Lee*; abundant
- *coronifer*, Marsh. *Blackbeath*; under furze bushes
- *repletus*, Fieb. *Shooters Hill Wood*; sweeping
- *flori*, Fieb. *Shooters Hill Wood*; sweeping
- *distinguendus*, Flor. *Shooters Hill*; sweeping
- *striatus*, Linn. *Blackbeath* and district; abundant
- *punctum*, Flor. *Plumstead*
- *argus*, Marsh. *Wickham Wood*; sweeping in open spaces
- Deltocephalus pulicaris*, Fall. *Kidbrook, Catford, Shooters Hill, Grove Park, Lee*
- Allygus commutatus*, Fieb. *Abbey Wood*; beating wych elm; *Tunbridge Wells* (Saunders)
- *modestus*, Fieb. *Grove Park, Lee, Blackbeath*; on fences during stormy weather
- *mixtus*, Fab. *Lee, Lewisham*; on oaks
- Thamnottetix prasina*, Fall. *Abbey Wood*; beating
- *dilutior*, Kbm. On oaks; *Wickham Wood*
- *subfuscula*, Fall. *Grove Park, Lee*, on oak and hazel; *Wickham Wood*, on hazel
- *variegata*, Kbm. *Plumstead Marsh*; sweeping
- *splendidula*, Fab. *Blackbeath*; beating ivy
- *crocea*, H.S. *Blackbeath, Lee, Plumstead*
- Limottetix 4-notata*, Fab. *Lee, Kidbrook, Shooters Hill*
- *sulphurella*, Zett. *Grove Park, Lee, Lewisham, Brockley*
- Cicadula variata*, Fall. *Wickham Wood*
- *sexnotata*, Fall. *Lewisham, Brockley*
- Alebra albostriella*, Fall. The three varieties fairly represented in the *Blackbeath* district
- Dicraneura citrinella*, Zett. *Wickham Wood, Deal* (Marshall)
- *pygmæa*, Dougl. *Darenth Wood* (Douglas)
- *variata*, Hardy. *Shooters Hill*; sweeping near furze bushes
- Kybos smaragdula*, Fall. *Blackbeath, Lee, Lewisham*; on willows, poplars, and alder
- Chlorita viridula*, Fall. *Kidbrook, Lewisham*; August sweeping and beating
- Eupteryx notatus*, Curt. *Folkestone Warren* (Douglas)
- *urticæ*, Fab. *Blackbeath, Lewisham* district; common on nettles
- *stachydearum*, Hardy. *Lewisham* (Douglas)
- *melissæ*, Curt. *Lee*; sweeping low plants
- *auratus*, Liv. *Blackbeath, Lewisham*, and several other places; on nettles
- *atropunctatus*, Goeze. *Greenwich, Catford*; in gardens on a variety of plants
- *abrotani*, Dougl. *Lewisham* (Douglas)
- *germani*, Zett. *West Wickham, Bostol Wood, Plumstead*; on pines
- *pulchellus*, Fall. *Blackbeath, Abbey Wood, West Wickham*; very common on oaks

INSECTS

- Eupteryx concinnus*, Germ. *Blackbeath*, *Shooters Hill*, *West Wickham*; on oaks, but more commonly on beech
- Typhlocyba jucunda*, H.S. *Catford*; on alders
- *sexpunctata*, Fall. *Brockley*; on sal-lows
- *debilis*, Dougl. *Kidbrook Lane*; beat-ing maple; *Darent Wood* (Douglas)
- *ulmi*, Linn. *Blackbeath* and many other places; on elm, very abundant
- *tenerrima*, H.S. *Kidbrook*, *Lee*; com-mon on brambles
- *aurovittata*, Dougl. *Kidbrook*; amongst oak
- *gratiosa*, Boh. *Blackbeath*; on beech
- *cratægi*, Dougl. *Kidbrook*, *Lee*; on whitethorn
- *lethierryi*, Edw. *Blackbeath*; very common on elm
- *rosæ*, Linn. *Kidbrook*; common amongst roses
- *salicicola*, Edw. *Lee*; amongst sal-lows
- *hippocastani*, Edw. *Greenwich Park*; on horse-chestnut; *Lewisham* (Douglas)
- *avellanæ*, Edw. *Wickham Wood*; on hazel; *Lewisham* (Douglas)
- *candidula*, Kir. *Blackbeath*, *Lee*, *Lewis-ham*; on *Populus alba*. This species is a recent addition to the British fauna. (See *E.M.M.*, December, 1900)
- *opaca*, Edw. *Greenwich Park*; on horse-chestnut, one specimen only; *Lewisham* (Douglas)
- *quercus*, Fall. *Blackbeath*, *Lee*, *Lewis-ham*, *Plumstead*; very common on oak

- Typhlocyba nitidula*, Fab. *Blackbeath*; on wych elm
- *geometrica*, Schr. *Catford*; on alders
- Zygina alneti*, Dahl. " "
- *flammigera*, Geoff. *Blackbeath*, on oak; *Lee*, *Lewisham*, on whitethorn
- *hyperici*, H.S. *Wickham Wood*; on *Hypericum*; *Darent Wood* (Douglas)

PSYLLINA

- Rhinocola ericæ*, Curt. *Plumstead*; on heath
- *aceris*, Linn. *Kidbrook*; on maple, one specimen only
- Aphalara exilis*, Web. and Mohr. *Deal* (Dale)
- *nervosa*, Först. *Bromley* (Douglas), *Lee* (Scott)
- Psyllopsis fraxinicola*, Först. *Catford*; on ash; *Lee* (Scott)
- *fraxini*, Linn. *Catford*, *Abbey Wood*; on ash
- Psylla salicicola*, Först. *Lee*; on willows
- *hippophæis*, Först. *Deal*; on sea buck-thorn
- *betulæ*, Linn. *Shooters Hill*, *Wickham Wood*; on birch
- *costalis*, Flor. *Plumstead*; on willows
- *peregrina*, Först. *Wickham Wood*; on whitethorn
- *alni*, Linn. *Catford*; on alders
- *forsteri*, Flor. " "
- *buxi*, Linn. *Greenwich Park*; on horse-chestnut
- *spartii*, Guer. *Plumstead*; on broom
- Arytæna genistæ*, Latr. " "
- Trioxa urticæ*, Linn. *Kidbrook*; on nettles, very common
- *viridula*, Zett. *Lee* (Scott)

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ARACHNIDA

Spiders

The spider fauna of this county should be at least as prolific in species as that of any in England, and would doubtless prove to be so if it were well worked. Had it not been for the efforts of the Rev. T. R. R. Stebbing of Tunbridge Wells there would have been scarcely any list to publish; for the rest, a few species are recorded by the author and Mr. F. P. Smith. A collection of the late Mr. F. Walker, preserved in the British Museum (*Nat. Hist.*) as microscopic slides, were collected at Southgate, Middlesex, and do not unfortunately include the types either of *Schænobates walkeri* or *Araneus signatus*, species which are probably the immature and variety of well-known spiders respectively. Of a total of 534 species of spiders recorded for Great Britain and Ireland, Kent can so far claim but 118; while of *Arachnida*, including pseudo-scorpions and harvestmen, there are only 122 species in all. In the following list where no authority or collector is quoted the author takes the responsibility.

ARANEÆ

ARACHNOMORPHÆ

DYSDERIDÆ

Spiders with six eyes and two pairs of stigmatic openings, situated close together on the genital rima; the anterior pair communicating with lung books, the posterior with tracheal tubes. Tarsal claws, two in *Dysdera*, three in *Harpactes* and *Segestria*.

1. *Dysdera cambridgii*, Thorell.
Lydd.

Not uncommon under stones and bark of trees, where it lurks within a tubular retreat. The spider is easily recognizable by its elongate form, orange legs, dark mahogany carapace and pale clay-yellow abdomen. The palpal bulb of the male has no cross-piece at the apex. The spider is also known as *D. erythryna*, Blackwall.

2. *Dysdera crocata*, C. L. Koch.
Gravesend (F. P. S.).

Larger than the last species, with a deep orange-pink carapace, orange legs, and abdomen with a delicate rosy-pink flush. The palpal bulb of the male has a cross-piece at the apex. This spider is also known as *D. rubicunda*, Blackwall.

3. *Harpactes hombergii* (Scopoli).
Rusthall (T. R. R. S.).

Rare under bark of trees, and recognizable by its linear ant-like form, black carapace, and pale clay-yellow abdomen and three tarsal claws.

4. *Segestria senoculata* (Linnæus).
Sevenoaks.

Not common; under bark of trees, in the crevices of loose stone walls and amongst detached rocks. Recognizable by its linear form and the black diamond-shaped blotches on the dorsal surface of the abdomen.

5. *Schænobates walkeri*, Blackwall.
Broadstairs (Walker).

Mr. Walker was in the habit of making microscopical slides of his specimens, and it is highly probable that this spider was an immature *Dysderid* flattened out by the glass cover-slip.

SPIDERS

DRASSIDÆ

Spiders with eight eyes, situated in two transverse rows. The tracheal openings lie just in front of the spinners. The tarsal claws are two in number, the anterior pair of spinners being set wide apart at the base, and the maxillæ are more or less impressed across the middle.

6. *Drassodes lapidosus* (Walckenaer).

Lydd.

Very common under stones. Also known as *Drassus lapidicolens*.

7. *Scotophæus blackwallii* (Thorell).

Tunbridge Wells (T. R. R. S.).

A dark elongate mouse-grey spider, often found wandering about the walls of dwelling and outhouses at night. Known also as *Drassus sericeus*, Blackwall.

CLUBIONIDÆ

Spiders with eight eyes, situated in two transverse rows. The tracheal openings lie immediately in front of the spinners. The tarsal claws are two in number, but the anterior pair of spinners are set close together at the base; the maxillæ are convex and not impressed across the middle.

8. *Zora spinimana* (Sundevall).

Tunbridge Wells (T. R. R. S.).

Known also as *Hecarge spinimana* or *maculata*.

9. *Clubiona stagnatilis*, Kulczynski.

Lydd.

Known also as *C. holosericea*, Blackwall. This species is usually fairly common amongst the dry sedge grass and rushes in swampy places.

10. *Clubiona terrestris*, Westring.

Yalding; Gravesend (F. P. S.); Tunbridge Wells (T. R. R. S.).

Not uncommon in the summer time, when it may be found wandering about at night on the walls of outhouses, palings, etc. Known also as *C. amarantha*, Blackwall.

11. *Clubiona reclusa*, O. P.-Cambridge.

Yalding.

A rarer species than the last; usually beaten from foliage and bushes in the summer time.

12. *Clubiona lutescens*, Westring.

Tonbridge.

Rare; but sometimes fairly abundant where it occurs amongst dry rushes and sedge grass in swampy places.

13. *Clubiona brevipes*, Blackwall.

Yalding, Tunbridge Wells (T. R. R. S.).

Not uncommon amongst foliage in the summer time.

14. *Clubiona pallidula* (Clerck).

Tunbridge Wells (T. R. R. S.).

A larger species than any of the above, and usually fairly common amongst bramble

bushes, where the female makes its egg-cocoon within the folded leaves. Known also as *C. epimelas*, Blackwall.

15. *Clubiona corticalis* (Walckenaer).

Sevenoaks.

Almost as large a species as the last-named. Not common; under the bark of large elm and other trees in ancient parks.

16. *Clubiona phragmitis*, C. L. Koch.

Yalding, Tonbridge.

Very common indeed amongst rushes and dry sedge grass in swamps, where the females construct a pure white silken retreat amongst the blades or under the bark of riverside palings, posts, pollard willow trees, etc. Known also as *C. deinognatha*, O. P.-Cambridge.

17. *Clubiona compta*, C. L. Koch.

Gravesend (F. P. S.).

A very small species, whose abdomen is striped diagonally on each side, similarly to that of *C. corticalis*. Not uncommon amongst the foliage of bushes and shrubs in the summer time.

18. *Chiracanthium erraticum* (Walckenaer).

Yalding.

Sometimes very common in the folded leaves of the various species of bramble in the summer time. The spider resembles a *Clubionid*, but has longer legs and a red stripe down the abdomen.

19. *Agræca brunnea* (Blackwall).

Tunbridge Wells (T. R. R. S.).

Rarely found amongst dead leaves and at the roots of herbage in woods. Known also under *Agelena*.

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ANYPHÆNIDÆ

20. *Anyphæna accentuata* (Walckenaer).

Hurst Wood (T. R. R. S.).

Often common on the foliage of oak and other trees. This spider is remarkable for the position of the spiracular opening, which

lies in the middle of the ventral surface of the abdomen between the genital rima and the spinners, and not, as in the last family, immediately in front of the spinners. Known also under *Clubiona*.

THOMISIDÆ

Spiders with eight eyes, situated in two transverse rows, two tarsal claws, and anterior spinners close together at their base. Maxillæ not impressed. The crab-like shape and side-long movements of these spiders are their chief characteristics, enabling them to be easily distinguished, as a rule, from the more elongate *Drassidæ* and *Clubionidæ*.

21. *Philodromus dispar*, Walckenaer.

Hurst Wood (T. R. R. S.).

This spider, with its shiny black abdomen, is not uncommon in the summer time amongst foliage, and can sometimes be observed crouching flat upon palings. It is very swift in its movements.

22. *Philodromus aureolus* (Clerck).

Tunbridge Wells (T. R. R. S.).

A very abundant species, with usually a dull red-brown abdomen, with yellowish central pattern. It frequents the foliage of trees of all kinds, and especially in the immature condition will outnumber all other species which fall into the umbrella beneath the beating-stick.

23. *Philodromus cæspiticolis*, Walckenaer.

Yalding.

This species is possibly only a variety of the last-named, and frequents similar situations. Known also as *P. cæspiticolens*, Blackwall.

24. *Tibellus oblongus* (Walckenaer).

Tunbridge Wells (T. R. R. S.).

A long, very narrow, dull white or straw-coloured spider, often common amongst dry grass in many different localities. They attain however their largest size amongst the sedge-grass and rushes in swamps and bogs. The elongate form assists in their conceal-

ment from foes as they lie close to the pale rush stems and slender dry blades.

25. *Xysticus cristatus* (Clerck).

Tunbridge Wells (T. R. R. S.).

This is by far the commonest of the 'crab-spiders,' and is found abundantly on foliage or crouching on bare places in fields and commons. Known also under *Thomisus*.

26. *Xysticus erraticus* (Blackwall).

Yalding.

A larger species than the last, having instead of a narrow wedge-shaped dark central bar on the carapace a broad spade-shaped dull red band margined with white. Known also under *Thomisus*.

27. *Misumena vatia* (Clerck).

Tunbridge Wells (T. R. R. S.).

This species, one of the largest of the *Thomisidæ*, can be found in the blossoms of various woodland plants, where it crouches amongst the petals on the watch for its prey. The colour of the female is yellow, with red lateral slashes; the male being much smaller and almost black. Known also as *Thomisus citreus*, Blackwall.

28. *Diæa dorsata* (Fabricius).

Tunbridge Wells, Hurst Wood (T. R. R. S.).

A bright green spider with large dull red-brown central patch on the abdomen; not uncommon on herbage and amongst flowers. Known also as *Thomisus floricolens*, Blackwall.

SALTICIDÆ

The spiders of this family may be recognized in a general way by their mode of progression, consisting of a series of leaps, often many times their own length. More particularly they may be known by the square shape of the cephalic region and the fact that the eyes are arranged in three rows of 4, 2, 2; the centrals of the anterior row being much the largest and usually iridescent. Those of the second row are the smallest, while the posterior pair is placed well back and helps to give the quadrate character to the carapace. Otherwise these spiders are simply specialized *Clubionids* with two tarsal claws and other minor characters possessed in common with members of this latter family.

SPIDERS

They can be beaten from foliage or found amongst herbage and under stones. The commonest, *Salticus scenicus*, will be well known to all observers, running and leaping on the walls of houses in the bright sunshine.

29. *Salticus scenicus* (Clerck).

Yalding, Tunbridge Wells (T. R. R. S.).

A black species with white lateral stripes. Known also under *Epiblemum*.

30. *Euophrys frontalis* (Walckenaer).

Tunbridge Wells (T. R. R. S.).

Known also under *Salticus*.

31. *Neon reticulatus* (Blackwall).

Tonbridge.

Known also under *Salticus*.

32. *Ergane falcata* (Clerck).

Sevenoaks.

Common amongst dry leaves in woods. Known also as *Salticus* or *Hasarius falcatus*.

33. *Heliophanus cupreus* (Walckenaer).

Folkestone.

A shining black and coppery spider, found in some abundance on the coast. Known also under *Salticus*.

34. *Ballus depressus* (Walckenaer).

Hurst Wood (T. R. R. S.).

A very small brown flattened species, found amongst dead leaves and herbage. Known also as *Salticus obscurus*, Blackwall.

35. *Pellenes tripunctatus* (Walckenaer).

Folkestone (Col. Le Grice).

A very rare species. Examples of both sexes were found hopping about amongst the chalk lumps on the coast.

PISAURIDÆ

Spiders with eight eyes in three rows of 4, 2, 2; the small anterior eyes being sometimes in a straight line, sometimes recurved and sometimes procurved. Those of the other two rows are situated in the form of a rectangle of various proportions, and are much larger than the eyes of the anterior row. The tarsal claws are three in number. *Pisaura* runs freely over the herbage, carrying its egg-sac beneath the sternum; while *Dolomedes* is a dweller in marshes and swamps.

36. *Pisaura mirabilis* (Clerck)

Yalding; Hurst Wood (T. R. R. S.), Gravesend (F. P. S.).

Known also as *Dolomedes* or *Ocyale mirabilis*.

LYCOSIDÆ

The members of this family are to be found running freely over the ground, and carrying the egg-sac attached to the spinners. Many of the larger species make a short burrow in the soil and there keep guard over the egg-sac. Eyes and tarsal claws as in the *Pisauridæ*, with slight differences.

37. *Lycosa ruricola* (De Geer).

Gravesend (F. P. S.).

Very similar to the next species, but the male has a claw on the palpus and the female a much smaller vulva. Known also under *Trochosa* and as *Lycosa campestris*, Blackwall.

38. *Lycosa terricola* (Thorell).

Tunbridge Wells (T. R. R. S.).

Known also as *L. agretica*, Blackwall, and under *Trochosa*.

39. *Lycosa pulverulenta* (Clerck).

Yalding; Tunbridge Wells (T. R. R. S.).

Known also as *L. rapax*, Blackwall, and under *Tarentula*.

40. *Pardosa lugubris* (Walckenaer).

Tunbridge Wells (T. R. R. S.).

A very abundant spider in the spring, run-

ning rapidly over the dead leaves in the woods. Known also under *Lycosa*.

41. *Pardosa pullata* (Clerck).

Yalding; Tunbridge Wells (T. R. R. S.).

Known also under *Lycosa* and as *L. obscura*, Blackwall.

42. *Pardosa palustris* (Linnæus).

Yalding.

Known also under *Lycosa* and as *L. exigua*, Blackwall (in part).

43. *Pardosa amentata* (Clerck).

Yalding; River Hill (T. R. R. S.), Gravesend (F. P. S.).

Very abundant on logs of wood or hatchways in meadows and by the riverside; also

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in gardens. One of our largest *Pardosas*. Known also under *Lycosa* and as *L. saccata*, Blackwall.

44. *Pardosa annulata*, Thorell.

Tunbridge Wells (T. R. R. S.).

Somewhat similar to but smaller than the

last-named species. Known also under *Lycosa*.

45. *Pirata piraticus* (Clerck).

Tunbridge Wells (T. R. R. S.).

Common in marshy places, carrying its pure white egg-sac on the spinners. Known also under *Lycosa*.

AGELENIDÆ

Spiders with eight eyes, situated in two transverse rows. Legs with three tarsal claws. The species of this family spin a large sheet-like web, and construct a tubular retreat at the back of it, which leads to some crevice amongst the rocks, the roots of herbage or the chinks in the walls of outhouses, wherever the various species may happen to be found. The posterior pair of spinners is usually much longer than the other two pairs.

46. *Tegenaria atrica* (C. L. Koch).

Yalding.

A very large spider with long legs, not uncommon in cellars and outhouses and also in holes in banks, etc.

47. *Tegenaria derhamii* (Scopoli).

Tunbridge Wells (T. R. R. S.).

Smaller, paler and more common than the last named; almost entirely confined to houses and outbuildings. Known also as *T. civilis*.

48. *Tegenaria silvestris*, L. Koch.

Tunbridge Wells (T. R. R. S.).

A still smaller species, sometimes not uncommon amongst rockeries in greenhouses and gardens. Known also as *T. campestris*.

49. *Agelena labyrinthica* (Clerck).

Yalding.

A common spider, large when full grown, spinning a huge sheet-like white web over the herbage, with a funnel-shaped tubular retreat. Like others of the family the posterior pair of spinners is formed of two distinct segments.

ARGYOPIDÆ

The spiders included in this family have eight eyes, situated in two rows, the lateral eyes of both rows being usually adjacent if not in actual contact, while the central eyes form a quadrangle. The tarsal claws are three, often with other supernumerary claws. The web is either an orbicular snare, or consists of a sheet of webbing beneath which the spiders hang and capture the prey as it falls upon the sheet. This immense family includes those usually separated under the names *Epeiridæ* and *Linyphiidæ*.

50. *Meta segmentata* (Clerck).

Hurst Wood (T.R.R.S.); Gravesend (F.P.S.).

A very abundant spider in the summer and autumn amongst nettles and other herbage along hedgerows. The spiders vary very much in size and spin an orbicular web having a clear space in the centre as do others of the genus and also *Tetragnatha*, thus differing from the genus *Araneus* (*Epeira*). Known also as *Epeira inclinata*, Blackwall.

51. *Meta merianæ* (Scopoli).

Yalding; Gravesend (F. P. S.).

A larger species found in cellars and damp places. Known also as *Epeira antriada*, Blackwall, and a variety with a white band down the centre of the abdomen as *E. celata*, Blackwall.

52. *Tetragnatha extensa* (Linnæus).

Tunbridge Wells (T. R. R. S.).

A very common species of elongate form which sits in the centre of its web with legs

stretched out in front and behind. Not so entirely confined to marshy localities as the next species and easily recognized by the silvery white band under the abdomen. The jaws in the males of this genus are very large and conspicuous.

53. *Tetragnatha solandri* (Scopoli).

Tunbridge Wells (T. R. R. S.).

Very similar to the last species in general appearance, but almost entirely confined to river banks and marshy swamps. Can be recognized by the dull white bands beneath the abdomen and the absence of any pale line on the sternum.

54. *Pachygnatha clerckii*, Sundevall.

Gravesend (F. P. S.).

Resembles a *Tetragnatha* in the possession of very large mandibles, but is not elongate and spins no web to speak of. Found under leaves and at the roots of herbage, especially in marshy places.

SPIDERS

55. *Pachygnatha degeerii*, Sundevall.

Gravesend (F. P. S.); Hurst Wood (T. R. R. S.).

Smaller and commoner than the last species. Found at the roots of herbage.

56. *Cyclosa conica* (Pallas).

Hurst Wood (T. R. R. S.).

A rare but easily recognized species, having a humped triangular abdomen and sits in the centre of its web on a band of white transparent silk, possibly from a distance appearing like the dung of a small bird upon the surrounding foliage. Known also under *Epeira*.

57. *Zilla* × *-notata* (Clerck).

Gravesend (F. P. S.).

A very common spider, usually spinning its web on or in the proximity of buildings. The web has a vacant wedge-shaped piece with a single free ray from the centre. Known also as *Epeira similis*, Blackwall.

58. *Zilla atrica*, C. L. Koch.

Hurst Wood, Tunbridge Wells (T. R. R. S.); Gravesend (F. P. S.).

Almost as common as the above, but more usually confined to the foliage of trees and bushes. The males have a very long palpus, while in × *-notata* these are very short. Known also as *Epeira callophylla*, Blackwall.

59. *Araneus cucurbitinus*, Clerck.

Tunbridge Wells (T. R. R. S.).

A beautiful green spider with bright red tip at the tail end, rendering it like the bud of a flower. Known also under *Epeira*.

60. *Araneus diadematus*, Clerck.

Tunbridge Wells (T. R. R. S.); Gravesend (F. P. S.).

By far the commonest of our spiders, being known as the 'garden spider,' of large size, usually red-brown with white lozenge-shaped spots, spinning an orb-web. Known also under *Epeira*.

61. *Araneus quadratus*, Clerck.

Rusthall Common (T. R. R. S.); Gravesend (F. P. S.).

A common spider in October on most heathy commons where it spins a strong orb-web and makes a tent for concealment under the heather or gorse. Its food consists chiefly of the common honey-bee, and in colour it is warm pink with green and yellow shading with four large white spots on the back of the abdomen. Known also under *Epeira*.

62. *Araneus cornutus*, Clerck.

Gravesend (F. P. S.).

Abundant in the rush-beds, etc., near

streams or in swampy places. Known also as *Epeira apoclista*, Blackwall.

63. *Araneus patagiatus*, Clerck.

Gravesend (F. P. S.).

Very similar to the last species but usually darker in colour and not so universally distributed about the country. Known also under *Epeira*.

64. *Araneus sclopetarius*, Clerck.

Gravesend (F. P. S.).

A much larger and more darkly marked species than either of the two last and found on the margins of streams, in the angles of boathouses, or on riverside palings. Known also as *Epeira sericata*, Blackwall.

65. *Araneus umbraticus*, Clerck.

Tunbridge Wells (T. R. R. S.).

A large species, very like the last in general appearance but much more flattened, for it lives under the bark of trees and posts, spinning a strong orb-web and venturing out of its lurking place only at nightfall. Known also under *Epeira*.

66. *Araneus gibbosus*, Walckenaer.

Sevenoaks.

A rare species, taken by beating lichen-covered bushes and trees, and recognized by the two angular tubercles on the shoulders of the abdomen. Known also as *Epeira arbus-torum* and *E. bicornis*.

67. *Araneus triguttatus*, Fabricius.

Hurst Wood (T. R. R. S.).

Not uncommon on iron palings, where the rust-red patch on the forepart of the abdomen resembles a spot of iron-rust and thus favours concealment. It can also be beaten from the foliage of trees. Known also as *Epeira agalena*.

68. *Araneus signatus*, Blackwall.

Broadstairs (Walker).

The type of this species has been lost, so that it is difficult to determine its identity with any certainty. It is probably only a variety of the last species. Known also under *Epeira*.

69. *Linyphia triangularis* (Clerck).

Yalding.

A very abundant species in autumn, whose sheet-like snares glistening with dewdrops form a conspicuous feature on the hedges and bushes in the early mornings. The mandibles in the male are very long, resembling those in *Tetragnatha*.

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70. *Linyphia pusilla*, Sundevall.

Tunbridge Wells (T. R. R. S.).

A smaller species than the last, with deep black ventral region. The palpus in the male sex has a long spiral spine. It spins its web near the ground amongst herbage. Known also as *L. fuliginea*, Blackwall.

71. *Linyphia montana* (Clerck).

Tunbridge Wells (T. R. R. S.).

A large species whose habits are similar to those of *triangularis*. It is however often found in conservatories and outhouses. Known also as *L. marginata*, Blackwall.

72. *Linyphia hortensis*, Sundevall.

Rusthall (T. R. R. S.).

Not a common species, somewhat similar to *pusilla* in general appearance and habits. Known also as *L. pratensis*, Blackwall.

73. *Linyphia clathrata*, Sundevall.

Yalding.

Resembles *montana*, but is smaller. Very common amongst herbage. Known also as *Neriere marginata*, Blackwall.

74. *Linyphia peltata* (Wider).

Hurst Wood (T. R. R. S.).

A very small and common species found amongst the foliage of trees and bushes in the summer time. A variety is known also as *L. rubea*, Blackwall.

75. *Labulla thoracica* (Wider).

Yalding.

Not uncommon in outhouses or under overhanging banks and rocks. The male is remarkable for the enormously long spiral spine on the palpal bulb.

76. *Stemonyphantes lineatus* (Linnæus).

Hawkesbury, Tunbridge Wells (T. R. R. S.).

Known also as *Linyphia bucculenta*, O. P.-C., and *Neriere trilineata*, Blackwall.

77. *Drapetisca socialis* (Sundevall).

Hurst Wood (T. R. R. S.).

Not uncommon, often abundant, where it occurs, sitting close to the bark of fir and other trees. Known also under *Linyphia*.

78. *Leptyphantes leprosus* (Ohlert).

Yalding; Tunbridge Wells (T. R. R. S.).

A very common species in stables, haylofts, and outhouses. Known also under *Linyphia*.

79. *Leptyphantes nebulosus* (Sundevall).

Tunbridge Wells (T. R. R. S.).

A rarer and larger species found in similar situations to the last. Known also as *Linyphia vivax*, Blackwall, and under *Linyphia*.

80. *Leptyphantes blackwallii*, Kulczynski.

Tunbridge Wells (T. R. R. S.).

Often very common at the roots of herbage in September. Known also as *Linyphia tenebricola* (Wider), O. P.-C., and *L. terricola*, O. P.-C. and Blackwall.

81. *Leptyphantes tenuis* (Blackwall).

Gravesend (F. P. S.).

Very similar to the last species and found under the same conditions. Known also as *Linyphia tenebricola*, O. P.-C.

82. *Leptyphantes minutus* (Blackwall).

Gravesend (F. P. S.).

Known also under *Linyphia*.

83. *Bathyphantes pullatus* (O. P.-Cambridge).

Yalding.

Known also under *Linyphia*. Common in marshy swamps.

84. *Bathyphantes nigrinus* (Westring).

Tonbridge, Tunbridge Wells (T. R. R. S.).

Known also as *Linyphia pulla*, Blackwall, and also under *Linyphia*. Common in marshes and swamps.

85. *Bathyphantes meadii* (O. P.-Cambridge).

Tonbridge.

Known also as *Linyphia approximata* (O. P.-C.). Common in localities similar to those in which the last two species are found.

86. *Bathyphantes concolor* (Wider).

Yalding.

Known also as *Theridion filipes*, Blackwall, and under *Linyphia*.

87. *Bathyphantes circumspectus* (Blackwall).

Tonbridge.

Known also under *Linyphia*.

88. *Bathyphantes dorsalis* (Wider).

Tunbridge Wells (T. R. R. S.).

Common on the foliage of trees and bushes in the summer time. Known also under *Linyphia* and as *L. claytonia*, Blackwall.

89. *Pæciloneta variegata* (Blackwall).

Tunbridge Wells (T. R. R. S.).

Known also under *Linyphia* and *Neriere*.

90. *Centromerus bicolor* (Blackwall).

Tunbridge Wells (T. R. R. S.).

Known also under *Linyphia*, *Neriere* and *Tmeticus*. Common in September and October, running on palings in the bright sunshine.

91. *Microneta viaria* (Blackwall).

Tonbridge.

Known also under *Neriere*.

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92. *Erigone atra* (Blackwall).

Yalding.

Known also under *Neriene*. Often abundant on railings.

93. *Tiso vagans* (Blackwall).

Hurstwood; Tunbridge Wells (T. R. R. S.).

Rare amongst dead leaves in woods and shrubberies. Known also under *Neriene* and as *N. longimana*.

94. *Gongylidium rufipes* (Sundevall).

Gravesend (F. P. S.); Tunbridge Wells (T. R. R. S.).

Known also under *Neriene* and as *N. munda*, Blackwall.

95. *Gonatium rubens* (Blackwall).

Gravesend (F. P. S.); Hurstwood (T. R. R. S.).

Known also under *Neriene*.

96. *Gonatium isabellinum* (C. L. Koch).

Yalding.

Known also as *Neriene rubella*, Blackwall.

97. *Dicyphus cornutus* (Blackwall).

Hurstwood (T. R. R. S.).

Known also under *Neriene*.

98. *Hypomma bituberculatum* (Blackwall).

Tunbridge Wells (T. R. R. S.).

Known also under *Neriene*.

99. *Stylothorax apicatus* (Blackwall).

Hurstwood (T. R. R. S.).

Known also under *Neriene*.

100. *Kulczynskiiellum fuscum* (Blackwall).

Yalding.

Known also under *Neriene*.

101. *Walckenaeria acuminata*, Blackwall.

Rusthall (T. R. R. S.).

Known also under the name *Walckenaera*.

102. *Diplocephalus latifrons* (O. P.-Cambridge).

Rusthall (T. R. R. S.).

Known also under *Walckenaera*.

THERIDIIDÆ

The members of this family have eight eyes situated very much like those of the *Argyropidae*, but the mandibles are usually weak, the maxillæ are inclined over the labium, and the posterior legs have a comb of stiff curved serrated spines beneath the tarsi. The web consists of a tangle of crossing lines, and the spider often constructs a tent-like retreat wherein the egg-sac is hung up.

103. *Theridion formosum* (Clerck).

Hurstwood (T. R. R. S.).

Not uncommon in the open woods amongst the young oak trees where the spiders spin an irregular tangled web close to the trunk, amongst the clusters of small twigs and shoots growing on the stems of the trees. Hanging somewhere in the web can be found a small tent-like domicile made of fragments of dead leaves, lichen and other débris. Within it the spider remains crouched, in close attendance upon her treasured egg-sac, dropping instantly to the ground if the tent-like retreat be handled or the web even touched. The female is about the size of a small pea, very gibbous, or humped on the upper side, orange or black with narrow white curving stripes running from the dorsal apex down the sides. Known also as *T. sisyphium*, Blackwall.

104. *Theridion tepidariorum*, C. L. Koch.

Yalding; Canterbury.

This large species is one of our commonest spiders in conservatories and greenhouses, where the curious triangular-shaped female may be seen hanging with legs closely gathered

to the body in the middle of the tangled web. Sometimes, but not often, a few chips of dry leaf fallen into the web may be utilized as a sort of apology for a tent-like retreat, constructed in the case of *T. formosum* with such elaborate skill. When prey of any kind falls into the toils the spider hurries down and with the tarsal comb on the fourth pair of legs commences kicking out from the spinners silken fluid, often quite moist like treacle, which strikes against and hardens on the victim. In this way very large spiders, beetles and woodlice are ensnared and converted into food. With a rapid and irritable movement of the forelegs also, small tufts of fine silk are gathered and flung promiscuously over the web. The male, a much smaller spider, may often also be seen hanging near at hand in the web, and the one or more brown pear-shaped egg-sacs also hang in the upper part of the toil. Sometimes these spiders are found outside the houses, but rarely, if ever, amongst the shrubs in the open garden.

105. *Theridion varians*, Hahn.

Tunbridge Wells (T. R. R. S.); Canterbury, Yalding.

A very much smaller species, varying con-

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siderably in colour, found abundantly in greenhouses and also amongst shrubs in the open garden. This species makes no tent-like retreat, but sits close to the one or more pale rounded egg-sacs usually spun up against a beam or window-sill.

106. *Theridion denticulatum* (Walckenaer).

Tunbridge Wells (T. R. R. S.).

Also a very small and abundant species, occurring on the outside of windows and outhouses and also on walls and palings. It makes no tent-like retreat and the habits are very similar to those of the last species.

107. *Theridion sisypium* (Clerck).

Gravesend (F. P. S.); Tunbridge Wells (T. R. R. S.).

Very common on gorse and holly bushes, where they construct a tent-like domicile and spin up within its shelter the small greenish egg-sacs. The young when hatched pass also their earlier days within the tent, but on the death of the mother spider they scatter, taking up positions for themselves amongst the neighbouring foliage. Known also as *T. nervosum*, Blackwall.

108. *Theridion pictum* (Walckenaer).

Hurst Wood (T. R. R. S.).

A very beautiful species, resembling a large example of *T. varians* with a bright red and white dentated band on the dorsal side of the abdomen, found, often abundantly, on holly and other bushes, where they construct a large and very perfectly formed thimble-shaped domicile, covered with dry chips of leaves and twigs, often decorated with the wings, legs, wing-cases and other débris of the victims which have served them for food.

109. *Theridion vittatum*, C. L. Koch.

Hurst Wood (T. R. R. S.).

Not uncommon on palings under trees or amongst herbage in woods. Known also as *T. pulchellum*.

110. *Theridion bimaculatum* (Linnæus).

Gravesend (F.P.S.) Hurst Wood (T.R.R.S.).
Known also as *T. carolinum*, Blackwall.

The males can be recognized by the sharp spur on the coxa of the fourth pair of legs.

111. *Theridion ovatum* (Clerck).

Tunbridge Wells (T. R. R. S.); Gravesend (F. P. S.).

A very common species. The female lives in the folded leaf of a bramble, or that of some other shrub, spinning the edges together. Within this domicile she constructs a round sea-green egg-sac about as large as a very small pea. The spider has a pale yellow abdomen with a broad pink central dorsal band or two pink bands, one on each side. Another variety has no pink bands, but a row of black spots on each side. The male and female can often be found together within their leafy domicile. This spider is also known under the name *Phyllonethis lineata*, and under *Theridion*.

112. *Theridion pallens*, Blackwall.

Hurstwood (T. R. R. S.).

This minute *Theridoid*, pale yellow in colour, with often a dark, or paler, dorsal spot on the abdomen, lives beneath the leaves of shrubs and trees, laurel, elm, lime, etc., where it spins its minute pear-shaped pure white egg-sac, which rests on its larger end and has several small cusps towards the sharp-pointed stalk.

113. *Steatoda bipunctata* (Linnæus).

Tunbridge Wells (T. R. R. S.).

A dark brown shiny rather flattened spider, living in chinks of walls, angles of windows and crevices in the partitions of old stables, etc., emerging usually at nightfall. The males are remarkable for their very large palpi and also for the possession of a stridulating organ, formed by a series of chitinous ridges in a hollow at the anterior part of the abdomen, which move over some cusps on the conical posterior of the carapace.

114. *Enoplognatha thoracica* (Hahn).

Tunbridge Wells (T. R. R. S.).

Known also as *Neriene albipunctata*, O. P.-Cambridge and *Drepanodus obscurus*, O. P.-Cambridge.

PHOLCIDÆ

Spiders with more or less slender bodies and very long slender legs. The eyes are situated in three groups—a group of two in the centre and a group of three on each side. The only British species we possess is a well known frequenter of houses in the southern counties, spinning an irregular web and moving swiftly with a circular shaking motion when alarmed.

115. *Pholcus phalangioides* (Fuesslin).

Tenterden (T. R. R. S.).

SPIDERS

DICTYNIDÆ

The spiders belonging to this family possess three tarsal claws, and the eyes, eight in number, situated in two transverse rows, the laterals being in contact. The cribellum (or extra pair of spinning organs) and the calamistrum (a row of curving bristles on the protarsi of the fourth pair of legs) are present in all members of the family. They construct a tubular retreat with an outer sheet of webbing, which is covered with a flocculent silk made with the calamistrum from threads furnished by the cribellum.

116. *Amaurobius similis* (Blackwall).

Tunbridge Wells (T. R. R. S.).

A very common species in greenhouses, stables and other outhouses. The males may often be found wandering above the walls of dwelling-houses after nightfall. Known also under the name *Ciniflo*.

117. *Amaurobius ferox* (Walckenaer).

Beckenham.

A much larger species, shiny black with pale markings, found in cellars and also beneath rocks and stones on the coast or in crevices of banks in the open country. Known also under the name *Ciniflo*.

118. *Dictyna uncinata*, Thorell.

Tunbridge Wells (T. R. R. S.).

CHERNETES

CHELIFERIDÆ

Out of twenty species of false scorpions hitherto recorded as indigenous to Great Britain only two have been taken in this county. That this small number is simply due to lack of investigation may be gathered from the fact that fourteen species of the order have been taken in the county of Dorset. The various species can usually be found amongst moss and dead leaves or beneath stones and the bark of trees. They are unmistakable on account of their possession of a pair of forcipated palpi, like those of the true scorpion. These are usually extended wide open when the Arachnid is alarmed while it hastens backwards to take shelter. In spite of this scorpion-like appearance these little creatures are much more nearly allied to the mites or Acaridea.

119. *Chelifer latreillii*, Leach.

Sandwich (Matthews); Deal (W. F. Blandford).

120. *Chernes insuetus*, O. P.-Cambridge.

Dover (W. P. Haydon).

This species, found amongst the refuse in an oil mill, has been taken in no other locality British or continental.

OPILIONES

The harvestmen are spider-like creatures with eight long legs, the tarsi long and very flexible. Eyes simple, two in number, situated on each side of an eye eminence. Body not divided into two distinct regions by a narrow pedicle, as in spiders. Abdomen segmentate; breathing apparatus consisting of tracheal tubes connected with external stigmata beneath.

121. *Phalangium parietinum*, De Geer.

Yalding.

122. *Nemastoma lugubre* (O. F. Müller).

Tonbridge.

CRUSTACEANS

IN the early part of the eighteenth century the natural history of Kent could be collected by an impartial hand without the least notice of crustaceans as forming part of the fauna. Yet indirectly the historian in question shows that the county is supremely well fitted to produce and harbour a great many species of this class, for he says: 'besides divers Bays and Creeks by the Thames and Sea-Side, there are sundry fresh Rivers and pleasant Streams; as the Medway, Darent, and Stowre, besides sundry Rivulets and Brooks, which supply the Inhabitants with Plenty of Fish, yet not to equal some other maritime Counties in Quantity, or Variety, except in their Oysters, found in the East Swale or near Faversham.'¹ He also mentions several plants as growing in ditches, brooks, salt marshes, and on the sea-shore. If it be added that the county lies between the waters of the North Sea and those of the English Channel, and that its land surface is richly diversified with woods, gardens, hedgerows, lanes and quarries, almost every favourable circumstance will appear to be combined for supplying it plentifully with crustaceans of various orders and diversified modes of life. The actual abundance of species is being gradually established by direct observation.

Of the genuine Brachyura a fair proportion are on record from the waters of Kent. These short-tailed decapods, with the nervous system highly concentrated, are the true crabs. They are rightly regarded as standing at the head of the Malacostraca. The most familiar British form and that which with us attains the largest size is *Cancer pagurus*, Linn., known as the great crab or the eatable crab. Bell notices that the family Bythessa of Kent is one of those that 'bear this animal in their coat-armour.'² In the British Association *Handbook to Dover*, (1899), Messrs. Sydney Webb and Edward Horsnaill, treating of 'Sea Life,' say that *Cancer pagurus* frequents the laminarian zone, but small specimens may often be found between tide-marks.' This is true of many places besides Dover, for the species is found all round our coasts and often in great abundance. The estimate regarding it, that a large female can carry on its swimmerets three millions of eggs and that even a small one can have half a million³ may help to explain the plentifulness. Experts, however, agree in strongly deprecating a wasteful use of

¹ *Magna Britannia et Hibernia, Antiqua et Nova*. . . . Collected and Composed by an impartial Hand, ii. 1194 (1720).

² *British Stalk-eyed Crustacea*, p. 66.

³ H. C. Williamson, *Fishery Board for Scotland, Ann. Rep.* xviii. pt. 3, 89 (1900).

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this bountiful supply. Inquiries with a view to restrictive legislation have led to many valuable reports, those of recent years by Wilson, Meek, Cunningham and Williamson usefully combining scientific with economic conclusions. Only one or two points out of many can be considered here. The process called ecdysis or exuviation is repeated probably several times in the life of every crustacean that reaches maturity. Many a schoolboy, preparing for a swim, instead of sedately taking off his garments one by one, will slip out of them all at one cast. A crab with the growing pains improves upon this. It slips out of its skin. It comes so clean and clear away from the skin of its teeth and the teeth of its skin that the slough is a complete model of the animal with carapace, limbs, jaws, feathered hairs, delicate spines, or whatever else may be the appropriate furniture. Having become too stout for its unyielding harness the crab bursts it, obviously for the sake of getting a chance to expand in a new and still flexible vest. But such of the Decapoda as have inflated claws, strongly encrusted and narrow at the joints, can find no easy task in withdrawing their arms from these natural sleeves. The procedure which they have inherited and cannot dispense with is no longer very well suited to the accoutrement with which in process of time they have become equipped. But besides being essential to growth, the casting of the shell is also of service in the pairing of crabs. It does not occur simultaneously in the two sexes. The male *Cancer pagurus* is still securely armoured while his consort is in the soft helpless state which follows exuviation, and under these circumstances is repeatedly found keeping watch and ward over her. Some naturalists, observing the husbands in this apparently chivalrous attitude, looked upon it as probably 'a pretty trait of cancerine character, and one not unworthy of their acute instinct and sagacity in other respects.'¹ There is however a somewhat less sentimental explanation available. There is reason to think that only while the skin of his partner is still pliable can the male find the auspicious time for introducing into the spermatheca the fertilizing elements.² Between the two sexes there are several differential characters. By one of them, according to Dr. Williamson, 'it is possible to distinguish the sex of a crab when it is little more than a quarter of an inch in breadth.'³ This difference lies in the circumstance that the infolded abdomen or pleon of the female has four pairs of swimmerets, whereas the first and second paired appendages of the male pleon are modified into organs for conveying the spermatophores into the spermatheca. While both sexes are still small, the narrow pleon of the male is contrasted with the broad one of the female, and later on the male is further distinguished by his more massive claws and by having the crenulated edge of his carapace broader and somewhat upturned. That the genital openings belong to the ultimate thoracic segment in the male but to the antepenultimate in the

¹ White, *Popular History of British Crustacea*, p. 39 (1857), quotation from Gosse.

² *Fishery Board for Scotland, 18th Annual Report*, pt. 3, 82.

³ Loc. cit. p. 99.

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female is the rule throughout the Malacostraca. Williamson points out that Frank Buckland was mistaken in supposing that soft crabs always contained a great deal of water, for 'the body fluid of the crab is not water; it is richly albuminous: on exposure to air for a little time it becomes black; and if a quantity of it is treated with picro-sulphuric acid it coagulates into a solid mass.'¹

In the family Cancridæ to which the great eatable crab belongs is placed a very different looking and somewhat anomalous form, *Pirimela denticulata* (Montagu). Kent has the credit of having introduced this pretty little species to science, though the honour of first naming it belongs to the celebrated Devonshire naturalist. Montagu called it *Cancer denticulatus*, and together with a characteristic figure supplied an account of much merit considering the date at which it was composed. He described it as follows:—'Thorax broad before, narrow behind, rugged with spines and tubercles, the margin continued in one series of subserrated denticulations: the front between the eyes is quinque-dentate, the middle spine the longest: the sides are also quinque-dentate, besides a small process over each eye: eyes prominent: antennæ obscure; the arms not longer than the body, angulated, or ridged longitudinally with blunt spines at the top of the middle joint; fangs angulated and denticulated; the legs are also angulated; claws subulate: tail narrow, regularly tapering. Length three-quarters of an inch, breadth rather more. This singular species of crab was sent to me, amongst a variety of British *Cancræ*, by my late worthy friend Mr. Boys, as the produce of the coast of Sandwich.'² It should be understood that by the 'fangs' are intended the thumb and finger of the chelipeds or front legs, the middle joints of which are spoken of as 'arms.' The subulate claws are the awl-shaped fingers or terminal joints of the walking legs. It is to be lamented that Montagu only described two out of the various '*Cancræ*' which his friend sent him as products of this county. Besides the extreme difference of size between the great *C. pagurus* and the little *Pirimela*, it will be noticed that the former has each antero-lateral border of the carapace divided into nine lobes, while in the latter each, by a much more common arrangement, is cut into five teeth. In the family which includes them both, the folding of the little first antennæ is longitudinal, but in the next two families it is transverse or very oblique.

Of the Xanthidæ one representative is reported from Dover, where, it is said, *Pilumnus birtellus* (Linn.) may be found 'under stones below Shakespeare's and Abbot's Cliffs.'³ This is a hairy little species having the 'front,' that is the border between the orbits, chiefly composed of two broad finely denticulate lobes. Each antero-lateral margin of the carapace has five teeth, but the tooth adjoining the orbit is very small.

¹ *Fishery Board for Scotland, 18th Annual Report*, pt. 3, 105.

² *Trans. Linn. Soc. London*, ix. 87, pl. 2, fig. 2 (paper read 1805, published 1808).

³ *Handbook to Dover*, p. 87. As all the references to this useful guide will be concerned with pages 87, 88, this notice will perhaps suffice once for all.

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The Portunidae, while agreeing with the Xanthidae in regard to the resting position of the first antennae, are distinguished both from them and the Cancridae by a character which in its full development is much more striking to the eye. Instead of having the terminal joint of the last legs subulate, they have it very much flattened so as to make a convenient swimming paddle. This character, however, is subject to many gradations, so that in the common shore crab, *Carcinus maenas* (Linn.), the joint in question is narrowly lanceolate, only a little more paddle-like than the stiliform 'fingers' of the three preceding pairs. One may look upon this as a natural accommodation to the shore-tramping habits of the animal. Leach says that 'this very common species inhabits all the estuaries and rocky shores of Great Britain, lurking beneath stones and tangle or burrowing in the sand.'¹ Its range indeed is very extensive, since it has been traced up the North Sea into almost arctic waters, to the Black Sea and the Red Sea, to Brazil, to the Bay of Panama, to the Hawaiian Islands, and now is shown by Messrs. Fulton and Grant to be establishing itself in Australian waters.² Adam White refers some of the specimens in the British Museum to 'Sandgate, Kent. From old collections,'³ and the *Handbook to Dover* says that '*Carcinus Maenas*, the common shore or green crab, is abundant, and a great source of pleasure to all children.' Of the genus *Portunus*, Fabricius, at least four species can be attributed to these waters. Bell, after mentioning other localities for *P. puber* (Linn.), the velvet swimming crab, adds that he has 'taken it on the southern coast of Kent, where, however, it appears to be more rare.'⁴ The *Handbook to Dover* says, '*Portunus puber* and *depurator* are swimming crabs, usually found near the lower water mark of our coast line.' Of *P. marmoreus*, Leach, Bell says, 'at Sandgate, in the month of May, 1844, I procured by dredging nearly four hundred specimens at two casts of the dredge, of which about three-fourths were females: several of these were carrying spawn, which is of a rich orange colour.'⁵ Of *P. pusillus*, Leach, Bell quotes the statement made by Mr. W. Thompson, the Irish naturalist, 'I have several times taken it in the stomach of fishes; in one instance, in a *Trigla Gurnardus*, taken in the open sea off Dover.'⁶ As this little species occurs off the Isle of Man, all along the southern coast of England, and in the Firth of Forth, the friendly intervention of a gurnard may suffice to establish its Kentish domicile. For *P. bolsatus*, Fabricius, we must have recourse again to White's *British Museum Catalogue* which attributes specimens of this species to 'Sandgate: from the collection of Col. Montagu.'⁷ The distinctions between this species and *P. marmoreus* are so undemonstrative that some may prefer to write the two under the older name given by Fabricius. The furry coat of the velvet crab (*P. puber*) and the rich blue of the exposed parts distinguish

¹ *Malacostraca Podophthalmata Britanniae*, text to pl. 5 (1816).

² *The Victorian Naturalist*, xvii. 145 (1900).

³ *Catalogue of British Crustacea in Brit. Mus.* p. 12 (1850).

⁴ *British Stalk-eyed Crustacea*, p. 92.

⁵ Loc. cit. p. 107. ⁶ Loc. cit. p. 113. ⁷ Op. cit. p. 15.

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it quite clearly from the marble crab which has a smooth carapace with patterns worked in buffs and reddish browns, and also from *P. depurator* (Linn.), the cleanser swimming crab, which has the carapace pale reddish brown in colour and irregularly granular in texture. Of this cleanser or port-scavenger Leach says, 'It is well known to the fishermen under the name of flying crab, and is supposed by them (though erroneously) to destroy oysters, by insinuating its flattened foot into the shells when the animal opens for food.'¹ The terminal joint of the fifth foot is here, as in *P. holsatus*, broadly oval and smooth, not ridged as in *P. puber*. *P. pusillus*, the dwarf swimming crab, is much smaller than the other species of the genus here recorded.

In the same section of Cyclometopa, or round-fronted crabs, is included another family, the Corystidae, represented in Great Britain by the singular masked crab, *Corystes cassivelaunus* (Pennant). The markings on the carapace, especially if a little accentuated by pen or pencil, give the effect of human features, and to this Bell's English name for it is due, the same idea having been previously conveyed by the Latin name, *personatus*, which Herbst bestowed upon the female. The chelipeds of the male are so very much longer than those of the other sex, that the earlier students may be excused for having thought that they had a specific distinction to deal with. In the Corystidae as in the Cancridae the first antennae are longitudinally folded, but whereas in *Cancer pagurus* the carapace is much broader than long, and the second antennae are inconspicuous, here the carapace is much longer than broad and the second antennae are as long as or longer than the carapace. Moreover by a geniculation of the peduncles these external antennae have their flagella brought close together in the longitudinal axis of the animal as if they were the inner instead of the outer pair. The masked crab has the habit of burying itself perpendicularly tail foremost in the sand at the bottom of the sea during the day time. While in this position it naturally finds the ordinary mode of respiration in vogue with the Brachyura by no means convenient. For as a rule the current of water which bathes the branchiae or gills enters the branchial chambers below the branchiostegite or branchial-cover, and comes out in front by the apertures at the sides of the mouth. But *Corystes* in its burrow being beset by sand, except for the little tube which it forms with its hairy second antennae stretched upward in juxtaposition, can only enjoy the current by reversing it. Mr. Walter Garstang, who by help of an aquarium has carefully watched this creature's behaviour, thus summarizes the matter: 'The elongation of the antennae, and the arrangement of the hairs upon them, the double bend of their basal joints, the structure of the parts bounding the prostomial chamber, and the arrangement of hairs upon them, are characters which in conjunction with the reversal of the respiratory current, adapt the respiratory mechanism of the crab in a remarkably complete manner to the arenicolous mode of life. The antennal tube enables the crab to draw its supplies of water directly from

¹ *Edinb. Encycl.* vii. 390 (1813).

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the superincumbent reservoir of water, while the arrangement of hairs is such as to constitute a sieve, keeping the sand away from the respiratory organs.’¹

The reader will no doubt perceive that the current entering from above, can, after bathing the branchiae, soak away as it pleases into the surrounding sand, but the sand however moist would not supply a stream which the crab could pump upwards. Bell allots this species to Kent among other localities, saying, ‘in May, 1843, at Sandgate, I took a single specimen with the dredge, and on the following day ten more in the shrimp-trawl; these were all females.’² The *Handbook to Dover* says ‘*Corystes cassivelaunus*, the helmet crab, is not uncommon in Eastwear Bay, where it burrows in the sand; it is occasionally found also in Dover Bay, and probably all round the coast in suitable localities.’

The section Catometopa, ‘with front deflexed,’ is poorly represented in the annals of Kent. It would be altogether unrepresented but for the above-mentioned *Handbook*, which remarks that *Pinnotheres pisum*, the little pea crab, lives within the shells of living mussels in amicable friendship.’ This would seem to imply that some friendships are not amicable, and perhaps the epithet was added expressly to rebut the stories which accuse pea-crabs of maltreating their hosts. Whatever their generic name may impute, they really do not hunt the pinna. They do not place malicious pebbles between the valves of casually gaping oysters. There is not the slightest proof that they make their meals of these or any other molluscs. In this genus the carapace of the female is remarkably soft. The external maxillipeds have the terminal joint attached, not as usual end to end with the preceding joint, but to the middle of that joint’s front margin.

The section Oxyrrhyncha, or ‘sharp beaks,’ have the carapace narrowed in front, and usually produced into a rostrum. Several species have been noticed in this county. All of them come under the popular designation of spider-crabs. *Macropodia rostrata* (Linn.) may be accepted on the authority of Mr. E. Lovett, who, using a preoccupied generic name, now discarded, says that ‘*Stenorhynchus rostratus* is common in the Thames Estuary.’³ *M. tenuirostris* (Leach) is vouched for from Whitstable by Messrs. Hardy and Oakden under the name ‘*Stenorhynchus tenuirostris*.’⁴ ‘*Pisa tetraodon* occurs at the Nore,’ according to Lovett.⁵ For this the more correct name is *Blastus tetraodon* (Pennant). Of *Hyas araneus* (Linn.) Leach says, ‘this species is very common on the coasts of Scotland and Kent. . . . The young is frequently found inhabiting pools of water amongst the rocks at low tide, and is often covered with fragments of marine plants, which adhere to the hairs of the legs and shell; in this state it has been observed on the coast of Perthshire, near Montrose, by G. Milne, Esq., and on that of Kent,

¹ *Journal of the Marine Biological Association*, new ser. iv. 231 (1896).

² *British Stalk-eyed Crustacea*, p. 161.

³ *The Essex Naturalist*, xi. 252 (1900).

⁴ *Journal of the Quekett Microscopical Club*, ser. 2, iv. 328 (1889).

⁵ *Essex Nat.* xi. 253.

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near Sandgate, by myself.' ¹ Bell says that 'he has dredged it on oyster-beds at Sandgate, of large size, at from ten to twelve fathoms,' and as to its habits makes the following observation: 'Mr. Hailstone states that this crab spawns in February; this, however, cannot be universally the case, as I took several females at Sandgate early in May, in the year 1843, every one of which was carrying her load of spawn, which is of a rich deep orange colour.' ² Of *H. coarctatus*, Leach, Bell says, 'Dr. Leach mentions Sandgate as a particular habitat, where I also obtained several specimens by dredging in May.' To this he presently adds: 'It is said by Mr. Hailstone to spawn in January. Amongst those which I obtained at Sandgate in the month of May, were several females, all without spawn.' ³ The distinctness of this species from *H. araneus*, its very constant companion, is said by competent observers not to be doubtful. The specific name refers to the constriction of the carapace, and the amount of variation of which this is susceptible does not appear to have been as yet subjected to any exact investigation. The *Handbook to Dover* says, '*Hyas araneus*, *Pisa tetraodon*, and one of the *Stenorhynchus*, presumably *tenuirostris*, all bearing the same trivial name [spider crab], are sometimes to be met with between high and low water marks on rocky parts of the coast.' But while corroborating other authorities for these three, the *Handbook* is the sole voucher for a more important species than any of them, by the following statement: '*Maia squinado*, the spider crab, with its spinous carapace, is not nearly so abundant with us as in many other seaside places; the young specimens of it are occasionally taken in crab and lobster pots. Its somewhat fierce aspect may be against it, but if it were only better known, it would command a large sale among gastronomic epicures.' The spines and hairs of the carapace often give shelter to various species of small amphipods. The propriety of its current technical name, *Maia squinado* (Herbst), involves questions almost more prickly than its coat. The genus *Maja*, with the alternative spelling *Maia*, was established by the celebrated Lamarck in 1801, ⁴ nominally to include the two genera which Fabricius had called *Inachus* and *Parthenope*. But the reference which Lamarck gives to Herbst for the first of these divisions has nothing to do with *Inachus*. It guides the reader to Herbst's description and figure of *Cancer maja*, which, as will presently be seen, belongs to an entirely different group of crustaceans. Since both *Inachus* and *Parthenope* are perfectly valid, Lamarck's *Maja* on its author's own showing has no standing place. It has no right to displace either of them, let alone both. In reality it was still-born, although for a hundred years authors in ignorance of the facts have allowed it a fictitious life. Independently of Lamarck's fatal confusion, there is a further difficulty, already pointed out by Miss M. J. Rathbun, that '*Maia* was used by Brisson, 1760, for a genus of birds, accepted by

¹ *Malacostraca Podophthalmata Britannia*, text to pl. 21A (1816).

² *Brit. Stalk-eyed Crust.* pp. 33, 34.

³ *Loc. cit.* pp. 38, 39.

⁴ *Système des Animaux sans vertèbres*, pp. 154, 428.

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many ornithologists.'¹ For *Maia squinado* I have now therefore deemed it absolutely necessary to propose the new generic name *Mamaia*, being led to the choice of that particular form by the desire to cause as little alteration as possible in the sectional titles, such as *Maiidae*, founded on the older name and needing a correspondent change.²

Of the *Brachyura anomala* the brown fur-coated *Dromia vulgaris*, Milne-Edwards, may, it seems, be claimed as a lawful prize for the fauna of this county. It is mentioned in the *Handbook to Dover*, and Bell says, 'The first intimation of the present species as a native of Britain occurs in an announcement by Mr. John Edward Gray, at a meeting of the Zoological Club of the Linnaean Society, as long since as June 22nd, 1824. These were stated to have been seen by that gentleman in Billingsgate Market, amongst some oysters, which had been brought from Whitstable Bay, on the Kentish coast.'³ Though the anomalous *Brachyura* like the genuine ones are devoid of well developed uropods, these missing appendages of the sixth pleon segment appear to be represented in the family *Dromiidae* by a pair of small lateral plates between the sixth and seventh segments. In this section the last pair of walking legs, when folded at rest, lie more or less on the back of the carapace and they are often very short. The branchiae also are not as in the true crabs limited to a maximum of nine pairs, but often exceed the number of fourteen pairs which is found in the family *Dromiidae*.

The *Handbook to Dover* says: '*Lithodes maia* and *Dromia vulgaris* prefer the deeper water in the Channel; they are only brought ashore at times by fishermen. The little *Porcellana longicornis* prefers also deep water: it is generally brought in upon scallops, and is also partial to cavities of *Eschara*. *P. platycheles*, on the contrary, is common under stones between tide-marks, a habit which also commends itself to *Galathea squamifera* below Abbot's Cliff. *Pagurus bernhardus*, the hermit crab, which conceals its defenceless body in an empty shell of whelk or natica, is more common upon mud than sand bottoms.' These observations introduce us to the *Macrura anomala*, the anomalous long-tailed decapods, most of which are distinguished from the true crabs by having uropods, and those which are without these appendages have in other respects a different arrangement of the pleon. To the latter group belongs *Lithodes maia* (Linn.), the 'northern stone crab,' an extremely interesting acquisition for Kentish waters. The extension of its range to the English Channel is noteworthy, but the record would be much increased in value could more precise information be furnished as to the place of capture and actual depth of water from which the capture was made. Fishing boats sometimes come into harbour from very distant excursions, and may occasionally bring in trophies not their own obtained by exchange. It is however now well known that

¹ *Proc. Biological Society of Washington*, xi. 160 (1897).

² On this subject the specialist may wish further to consult *Proc. Biol. Soc. Washington*, xviii. p. 73 (Rathbun), p. 157 (Stebbing) (1905).

³ *Zoological Journ.* i. 419; *Brit. Stalk-eyed Crust.* p. 371

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the family Lithodidae has a very extensive distribution, and that species in general, once supposed to be strictly boreal, find their way far south in deep water. The close resemblance of *Lithodes maia* to the true crabs is indicated by the frequent confusion between it and the species renamed above as *Mamaia squinado*. In dorsal view and in handling, these thorny crustaceans are not so very dissimilar, but in the structure of the pleon or tail there is great divergence. Besides difference in the appendages, the pleon of *Lithodes* is composed, not of simple segments placed regularly end to end, but of rows of calcified plates, which in the female exhibit an extraordinary want of symmetry. This last character helps to explain the close connexion recognized between two assortments of Crustacea, the Lithodinea and Pagurinea, which are combined under the *Paguridea*, though superficially not at all alike. Of the second group *Eupagurus bernhardus* (Linn.), the best known English hermit crab, is found in Kent both according to the *Handbook*, and according to the *Journal of the Quekett Microscopical Club*, two members of which, Messrs. Hardy and Oakden, report it as observed at Whitstable in September 1889. The elongate, soft, twisted pleon of the hermit is obviously unsymmetrical.

From the *Paguridea* we pass to the *Galatheidea*, which include the crab-like Porcellanidae and the lobster-like Galatheidæ. Both families are symmetrical, both have the uropods well developed, and both like the rest of the Macrura anomala have only the first pair of legs chelate and the fifth pair very small. Of the two common little English species *Porcellana platycheles* (Pennant) is easily distinguished from *P. longicornis* (Linn.) by the much greater breadth of its chelipeds. Both species have long second antennae. By the thin pleon flattened against the breast they are marked off very clearly from the Galatheidæ. Of the latter family *Galathea squamifera*, Leach, has been already mentioned as occurring at Dover. Another species, *G. strigosa* (Linn.), can also be claimed on the faith of a notice in *Country Life* for April 6, 1901, to which my attention was called by Mr. Lionel Robinson, sometime editor of the *Annual Register*. An excellent figure of the species is given, from a photograph by Mr. Charles Hussey, who in sending it made the following observations:—‘The original was picked up alive between Sandown Castle and Deal Pier by Mr. James Richardson, who sent it on to me for identification, but I must candidly confess I do not know what it is. My ignorance, however, is shared by every one who has seen it. None of the many fishermen in this district have seen a similar specimen before, and as most of them have spent their whole lives on the beach and in fishing round here, their ignorance is fairly strong evidence that this shell-fish is, if not new, at any rate exceedingly rare. . . . The *live* colours of this specimen were exceedingly beautiful. The shell was a vivid red, almost the colour of a boiled lobster, picked out with fantastic designs in Cambridge blue (shown as white in the photograph), the claws were a dull brown with crimson tips, the thorns, both on claws and body, tipped with white. The inside edges of the

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tips of the claws, as the photograph clearly shows, are covered with stiff hair or bristles, brown at the base, tipped with crimson, the eyes dark indigo blue. The length of the specimen over all is 6 inches; from snout to tip of tail $3\frac{1}{4}$ inches; length of claws from socket to tip, $3\frac{3}{4}$ inches; greatest width across the carapace, $1\frac{3}{8}$ inches. The only crustacean which I can find mentioned in the books at my disposal which is at all likely to answer to the specimen in my possession is the painted squat lobster (*Galathea strigosa*). It is, however, only just mentioned; there is no description nor illustration of it, and as I have never seen a specimen, I am unable to confirm or refute the theory. Against the idea of its being a lobster are the facts of its size, its colour, its having only three pairs of legs—lobsters and nearly all crabs have four; the Japanese porcupine crab (*Lithodes hystrix*) is among the notable exceptions to the rule—and the long slender claws covered with hair at the tips. The relative size of the cephalothorax and the abdomen seem to point to its being a connecting link between the long-tailed and short-tailed crustaceans.'

As there are five British species of *Galathea*, it is fortunate that Mr. Hussey gave particulars of size and colour and a trustworthy portrait by which his felicitous 'theory' as to the name of the species can be fully confirmed. His inference from the fishermen's ignorance is more open to question, since ignorance as a rule is 'fairly strong evidence' of nothing but its own innocent self. As already explained, the last pair of legs, fifth or fourth according as the chelipeds are or are not reckoned in the series, are not wanting in these crustaceans. They are very slight and often doubled away within the branchial cavity so that they escape notice. The Japanese porcupine crab, now known as *Acantholithus histrix* (de Haan), has also its full complement of legs. According to the most modern view, the lobsters do indeed lead up to these *Macrura anomala* and also to the *Brachyura*, but through two separate lines of evolution, not as was formerly thought through the former to the latter. For distinguishing *G. strigosa*, which Adam White calls the common plated lobster, from *G. squamifera*, which he calls Montagu's plated lobster,¹ it should be noticed that the latter has nine spines to the rostrum, and the former has seven, the foremost of these seven being much more advanced than the foremost of the nine. *G. strigosa* is much the larger with the hands of its chelipeds more spinose, and with the third joint of its outer maxillipeds longer than the fourth, while in the other species that relation of length is reversed.

In the great assemblage of the normal *Macrura* Kent is sparsely represented, though the few species it can claim are distributed among several families. The list may properly be headed by the common lobster, *Astacus gammarus* (Linn.), and the Norway lobster, *Nephrops norvegicus* (Linn.), both belonging to the family *Nephropsidae*. The former is no doubt intended by Ireland in his history of Kent, when he says, 'The native Milton oysters are superior to any others, as well as

¹ *Popular History of British Crustacea*, p. 87.

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the lobsters caught off the Isle of Thanet.' ¹ Herein he is perhaps evincing a fine patriotism of the palate, rather than stating the result of actual comparison between Kentish lobsters and those of all other counties and countries. The *Handbook to Dover* says, '*Homarus vulgaris*, the lobster, of course occurs, but it is far from common with us, although one of 12 lbs. weight was hooked and brought to the surface by an angler upon the Admiralty Pier some years ago. *Nephrops norvegicus*, the small red or Norway lobster, is much more equable in size, and never attains even the dimensions of *vulgaris* of but moderate growth.' Of these two species the more accurate scientific names have been already given. The species themselves run no risk of being confounded, the colours being very distinct, and the sharply four-sided hands of the chelipeds in *Nephrops* being very characteristic. In the neighbouring family of the Potamobiidae the river crayfish, *Potamobius pallipes* (Lereboullet), is distinguished from both the lobsters by having, among other differences, the last segment of the thorax or peraeon slightly movable instead of coalesced with the one preceding. All these three species agree in having the second and third pairs of legs chelate, though in a far feebleness than the first pair which generally monopolize the title of chelipeds. They differ in several details affecting the rostrum, the 'scale' of the second antennae, and other points. The occurrence of the river crayfish in Kent does not appear to have been hitherto recorded. My friend the Rev. R. Ashington Bullen, F.L.S., F.G.S., informs me that it occurs in the river Darent in Kent at Shoreham, and that he kept specimens alive in his vicarage there. Also my neighbour Mr. Rix assures me that in his boyhood it frequented the streamlet running through Bishops-down Park, Tunbridge Wells.

Of the tribe *Caridea*, containing the majority of the world's shrimps and prawns, only four species are told of in this county. When *England's Topographer* says that 'Courtstairs, otherwise Pegwell Bay, is famed for shrimps, lobsters, turbot, soles, mullets, etc., and a most delicious flat fish, called a prill, very much sought after,' ² his shrimps are probably *Crangon vulgaris*, Fabricius, but if not, the occurrence of that species at Whitstable is vouched for by Messrs. Hardy and Oakden of the Quekett Microscopical Club, who also give the same locality as a habitat of *Palaemon serratus*. Dr. G. S. Brady incidentally mentions the finding of *Crangon vulgaris* at Gravesend. ³ In the Appendix to his '*Report on the Fisheries of Norfolk*' Frank Buckland quotes, from '*Rules, Orders, and Ordinances for the Fisheries in Thames and Medway*' under date 1785, the following decrees, 'White shrimps shall only be taken from the 24th day of August yearly to the 25th day of March; Red shrimps shall be taken in the river Medway only, and

¹ *England's Topographer, or A New and Complete History of the County of Kent.* By W. H. Ireland, p. 101 (1828).

² Op. cit. i. 536. The name 'prill' has passed out of use in favour of 'brill.'

³ *Trans. Linn. Soc. London*, xxvi. pt. 2, 376 (1868).

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that from the 25th day of April yearly to the 1st day of July.' The terms are a little indefinite. Adam White calls *Palaemon squilla* the 'White Shrimp,' but adds that 'other species beside this are named "White Shrimp."' ¹ Mr. Lovett says of *Pandalus annulicornis*, 'It is in fact the "Red Shrimp" of the Thames excursion steamers. It works the tide up and down for its food, and is a most useful scavenger. The term "Red Shrimp" is applied to several diverse species round the coast. At Southampton I saw *Palaemon squilla* (the small prawn) hawked about under this commercial name, and *P. varians*, where it occurs commonly, is also so called.' ² *The Handbook to Dover* says, '*Pandalus annulicornis*, the red or soldier shrimp, and *Crangon vulgaris*, the brown shrimp, are imported, for Dover is one of the very few seaside resorts where shrimping does not commend itself as a livelihood to any of its inhabitants. *Palaemon serratus*, the prawn, occurs sparingly to the west, but in St. Margaret's Bay, where the scour of the tides is less, they may be obtained in some seasons very commonly.' From these passages there is obviously no sure inference that the small prawn, *Leander squilla* (Linn.) has been taken in Kentish waters. On the other hand, allowing for changes in nomenclature, there is satisfactory attestation of *Leander serratus* (Pennant), *Pandalus montagui*, Leach, and *Crangon vulgaris*, Fabricius, representing respectively three families, the Palaemonidae, Pandalidae, and Crangonidae. The first two species, which the unlearned may prefer to call prawns, have a long serrate rostrum projecting from the carapace. The third species, the common shrimp, has no rostrum worth speaking of. It is further distinguished by the first pair of legs. These are moderately robust, but only subchelate. They are grasping organs, but the finger, instead of closing against a produced thumb with the action of tongs, closes down upon the dilated end of the palm. In *Leander* the nippers are of normal structure but small. In *Pandalus* they are so minute that till recently their existence was overlooked and the limbs were thought to end in a simple point. The second pair of legs are chelate in all the three species, though here also there are several differences of structure. In none of the three, nor in any others of the tribe Caridea, are the third pair of limbs chelate, as they are in the lobster and the river crayfish.

Of the stalk-eyed Crustacea one more species has to be noticed. This is no proper prawn, though its correct name is *Praunus flexuosus* (O. F. Müller). It belongs to the order Schizopoda, which owe their name 'cleft-footed' to the circumstance that their legs are two branched. The malacostracan appendages when fully developed have a branch called the epipod given off from the first joint, and another called the exopod usually given off from the second. It is this exopod which has in general disappeared from the limbs of the peraeon, but is retained in the Schizopoda. Colonel Montagu, who in Devonshire had himself found Müller's *Cancer flexuosus*, chose while recognizing that name to

¹ *Popular History of British Crustacea*, p. 135.

² *The Essex Naturalist*, xi. 255.

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figure and describe the species under a new one, *Cancer Astacus multipes*. He says 'By means of the accurate pencil of Mr. Henry Boys, who favoured me with drawings of many of the marine animals found at Sandwich, I have been able to identify this crab as an inhabitant also of the Kentish coast.'¹ The genus *Macromysis*, White, to which this species is often referred, is much later than Leach's *Praunus*.

To the sessile-eyed Malacostraca of this county no great attention has hitherto been paid. *The Handbook to Dover* incidentally mentions a single isopod, saying in regard to *Leander serratus*, 'Oftentimes the carapace is disfigured by the internal parasite, *Bopyrus squillarum*, scarcely a specimen being free from it, but in the last two years they appear to have escaped.' Strictly speaking, this is not an internal parasite. In the proper sense of the word, one might say, it is not a parasite at all. The animal insinuating itself between the side wall of the prawn's carapace and its branchiae lodges there, apparently without doing its host any damage whatever unless by wounding its vanity. But if the prawn suffers from the look of having a swollen cheek, the female *Bopyrus* endures more injury than she inflicts. In her narrow apartment she becomes quite lopsided and foregoes all independence of movement for the sake of the very numerous progeny which she brings into the world. Her mate is by comparison insignificant in size, but he retains his symmetry and a limited pedestrianism. Giard and Bonnier have pointed out that Latreille, to whom the generic and specific names of *Bopyrus squillarum* are due, did not distinguish *L. serratus* from *L. squilla*. They therefore propose the name *B. fougerouxii* for the species of *Bopyrus* which is found in the former.

Of all the free-swimming marine Isopods I find none mentioned except *Sphaeroma serratum* (Fabricius) as to which Leach says, 'This species is very common on the rocky shores of Devonshire, Kent, and Cornwall.'² As the generic name implies, these creatures can roll themselves up into spheres like some of the land isopods.

The freshwater isopod of England is *Asellus aquaticus* (Linn.). It is abundant in little weedy streams about Tunbridge Wells and not likely to be scarce in any county.

The Isopoda terrestria are at present less meagrely represented than the aquatic families, though adequate research would be sure to invert this numerical relation. *Lugia oceanica* (Linn.) has been observed at Dover and other places on the coast of Kent by Messrs. W. M. Webb and J. A. Murie. This is a land species never found except at the lip of the sea.³ *Trichoniscus pusillus*, Brandt, is recorded from Chislehurst by Bate and Westwood,⁴ under the name *Philougria riparia* (Koch). From the following species of the group it may be briefly distinguished as alone having a four-jointed flagellum on the peduncle of the second antennae. *Philoscia muscorum* (Scopoli) has this flagellum three-

¹ *Trans. Linn. Soc. London*, ix, 91 (1808).

² *Ibid.* xi, 363 (1815).

³ W. M. Webb and C. Sillem, *The British Woodlice*, p. 20, pl. 1 (1906).

⁴ *British sessile-eyed Crustacea*, ii, 457.

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jointed. It is a smooth and shining, rapidly running species, common at Tunbridge Wells, and probably all over England. *Oniscus asellus*, Linn., agrees with it in the number of joints to the flagellum and in being found at Tunbridge Wells and indiscriminately elsewhere, but it is very much larger, slow-moving, and though glossy by no means absolutely smooth. In all our remaining species the flagellum is two-jointed, still in *Platyarthrus hoffmannseggii*, Brandt, the first of the two joints is characteristic by its minuteness. This species has been taken at Tunbridge Wells in an ants' nest, the habitat which it appears invariably to occupy. *Porcellio scaber*, Latreille, is common at Tunbridge Wells, but not a rarity anywhere. Of the same genus *P. pictus*, Brandt and Ratzeburg, and *P. laevis*, Latreille, are also assigned to this county.¹ Between the first and third no confusion is possible, because *P. scaber*, as the name intimates, is rough all over with tubercles, while the very broad *P. laevis* is named from the smoothness of its surface. The painted Porcellio is recorded from Chislehurst and has also been taken at Tunbridge Wells. It comes near to *P. scaber*, but it differs from it in having the first joint of the flagellum longer than the second. Also the head is very dull in contrast to the variegated colouring in the rest of the dorsal surface. *Metoponorthus pruinosis*, Brandt, is recorded from Chislehurst.² It differs from the species of *Porcellio*, which have the front strongly trilobed, by a reduction of the lateral lobes giving it comparatively a 'straight front' in accord with its generic name. *Cylisticus convexus* (de Geer) is reported by Mr. W. M. Webb from Bluebell Hill, Maidstone. It is like *Porcellio*, but capable of globation.³ *Armadillidium vulgare* (Latreille) and *A. nasatum*, Budde-Lund, have both been taken at Tunbridge Wells, and the latter also at Riverhill, near Sevenoaks. From all the preceding terrestrial isopods, except *Cylisticus*, they are marked off by the power they possess of rolling up into a ball. In the common species the front is simple, but in *A. nasatum* its middle part is turned back dorsally with something of a nasiform projection. Though twelve out of the twenty-four English species may be thought a fair proportion for a single county to possess, no doubt Kent will eventually be found to have several in addition to those here enumerated.

The Amphipoda, which agree with the Isopoda in having sessile eyes and a peraeon or middle body of seven articulated segments, differ from them very essentially by the position of the breathing organs. These in the genuine isopods are confined to the pleon, but in all the amphipods are attached to limbs of the peraeon. Of this latter order the species are extremely numerous, and it is reasonable to suppose that the few recorded from Kentish waters are an inconsiderable percentage of the number really present. The fresh-water species, *Gammarus pulex* (Linn.), is plentiful here as elsewhere, found in ponds, rivulets, and occasionally in wells. But of more interest are the 'well shrimps'

¹ *British sessile-eyed Crustacea*, ii. 482, 484.

² Loc. cit. ii 488.

³ *The British Woodlice*, p. 39, pl. 21.

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proper, which are limited to the last kind of habitat. A diligent and prolonged inquiry after these curiosities for a great while led to nothing but vague information and unfulfilled promises, until, at length, a lecture delivered to a working class audience produced the desired result. Of *Niphargus aquilex*, Schiödte, Mr. Spalding has since then from time to time very obligingly supplied me with living specimens from his well at Rusthall, Tunbridge Wells. Some of them have lived very inexpensively for months in a small glass jar supplied with nothing but clear water. Out of respect to their former domicile their new home was kept in the shade. *Niphargus fontanus*, Spence Bate, has been taken by Mr. Lubbock (now Lord Avebury) 'in a well at High Elms in Kent.'¹ Between these two species there is a considerable difference in the second pair of limbs, which have the hands elongate pear-shaped in *N. fontanus*, but subtriangular, short and broad in *N. aquilex*. Their colourless transparency at once distinguishes these well-shrimps from the greenish or brownish *Gammarus*, but there are several other points of difference. If attention be turned to the terminal appendages, known as the third uropods, those in *G. pulex* will be found to have the two branches not very unequal, but in *Niphargus* the inner branch is rudimentary, while the outer is very elongate and distinctly two-jointed. Of marine species *Melita palmata* (Montagu) has been sent me from Whitstable by Mr. G. S. Saunders, F.L.S., together with *Fassa pulchella*, Leach, which till recently has been by a misconception transferred to the genus *Podocerus*. The singular mud-burrowing *Corophium volutator* (Pallas) under the untenable name *C. longicorne*, Latreille, is recorded by Leach who says that it 'Inhabits the coast of the European Ocean. At low tide it may be observed crawling amongst the mud. It is very common at the mouth of the river Medway, from whence we have received a vast number of specimens.'² For *Caprella linearis* (Linn.) from Whitstable I am indebted to Mr. G. S. Saunders. While all the other amphipods here named belong to the tribe Gammaridea in which the pleon is highly developed, this last species belongs to the Caprellidea in which the pleon is almost evanescent. In this tribe the species of the family Caprellidae from their extreme tenuity have been called spectre-shrimps, and from their habit of bowing with the front part of their bodies while with their hind feet they cling to seaweeds they have also been called praying shrimps. Adam White, however, gives to *C. linearis* the elegant name of 'Pennant's Skeleton Screw.'³

In the Entomostraca we no longer find that steadfastness of pattern which can be traced throughout the Malacostraca, allowing us to believe, in spite of all existing exceptions, that between the eyes at one end of the animal and the telson at the other there are or have been nineteen body-segments each with its pair of appendages. In the Entomostraca the body-segments may be more in number, or as is generally the case they

¹ *British sessile-eyed Crustacea*, i. 321.

² *Encyclopædia Britannica* (5th Ed.), Art. Annulosa, p. 426 (1816).

³ *Popular History of British Crustacea*, p. 214.

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may be fewer, but the mystic nineteen is a number avoided. There are three principal divisions, the Branchiopoda named from their branchial feet, the Ostracoda with carapaces in the fashion of bivalve shells, and the Copepoda called oar-footed because their legs are locomotive, in contrast to the Cladocera which swim by help of their second antennae.

The first subdivision of the Branchiopoda consists of the Phyllopoda, the 'leaf-footed.' Of this notable company there are three sets. One of these, with which we are not here concerned, is called Conchophylla, because all the leaf-like feet are concealed in a bivalved shell-like carapace; another is called Gymnophylla because all the 'leaves' are exposed to view, and a third is named Notophylla because a large dorsal shield covers many but not all of the footbearing segments. This last is or was illustrated in Kent by the wonderful *Apus cancriformis*, Schaeffer. The species is described by Baird as 'about two inches and a half long, and one inch and a half in diameter; of a brownish-yellow colour, clouded with marks of a deeper hue.' There are sixty pairs of feet, the structure of which is not a little complicated, comprising on the inner line a maxilla-like basal lobe followed by five subjointed 'endites,' and on the outer two 'exites,' namely, a flask-shaped gill and a simple triangular flabellum or accessory gill. The eleventh pair of feet carries the ovisacs in the female and the genital openings in the male. Behind this the caudal part of the animal has segments with several pairs of appendages to each and several segments without any appendages, the last segment of all however being provided with two long jointed streamers.¹ Herr Stadt-Secretarius Klein first introduced this remarkable creature to science by sending it, with a good drawing and Latin description, from Dantzic to the entomologist Joh. Leonhard Frisch, who published it in 1732.² Klein, it appears, soon afterwards wrote about it to Sir Hans Sloane, and in connexion with this letter, the following paragraph is worth quoting from Baird's long and excellent discussion of the species:—

'About the same time a number of specimens of the same animal were found in Kent by the Rev. Mr. Littleton Brown, F.R.S., who, in August 1736, sent a specimen, with a letter to Dr. Mortimer, then secretary to the Royal Society, and which is published, along with Klein's letter to Sir Hans Sloane, in the *Philosophical Transactions* for 1738, No. 447. "I brought it," he says, "from a pond upon Bexby (Bexley?) Common, where great numbers have been observed for these five weeks past. The pond was quite dry, the 24th of June, but upon its being filled with the great thunder-shower, upon the 25th, within two days the pond was observed to swarm with them, by a farmer watering his cows there."'³

Of the Gymnophylla Baird reports finding the 'Fairy Shrimp,'

¹ *British Entomostraca*, p. 30 (1850).

² See Packard, *U.S. Geological Survey*, p. 315 (1883).

³ *Beschreibung von allerlei Insecten in Teutschland*, pt. x. p. 1.

⁴ *British Entomostraca*, p. 29.

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Ghirocephalus diaphanus, Prevost, in pools on Blackheath, a locality which, if now in the county of London, in those days belonged to Kent. This species, though very similar in structure to the *Apus*, is through the absence of the shield very different in appearance. Also its eyes are stalked instead of sessile, and its feet are reduced to the more moderate number of eleven pairs. The second antennae of the male form large claspers, thus accounting for the generic name which implies that the head is furnished with hands. The specific name alludes to the beautiful translucence of the animal. Its eggs, like those of many other freshwater Entomostraca, can remain a long time in dried mud without losing the capacity of developing subsequently in water.

The Cladocera, a second subdivision of the Branchiopoda, are named from the branching second antennae which are their locomotive appendages. They furnish the fresh waters of all counties with numerous species. In Kent about a score of species have been catalogued, several of them quite recently through the assiduity of Mr. D. J. Scourfield, editor of the *Journal of the Quekett Microscopical Club*. It happens that all these species are included in one tribe, called the Anomopoda because they have their five or six pairs of feet not all alike, the first two pairs being, in contrast to those which follow, more or less prehensile and without branchial laminae. The tribe is divided into four families, among which the known Kentish species are represented as follows. The family Daphniidae no doubt contributes *Daphnia pulex* (de Geer), since that species, according to Baird 'lives in almost all pools, and ditches of standing water, round London, etc.'¹ But this commonest of species is not free from perplexities, as will be seen by those who study the synonymy in Lilljeborg's great work on the Cladocera of Sweden. Baird establishes two other species of the genus *D. psittacea* from 'Pond on Blackheath' and *D. schoefferi* from 'Pond on Bexley Heath, Kent, August and September, 1849.'² In addition to these *D. obtusa*, Kurz, is reported from Keston by Mr. Scourfield, and a variety *propinqua* of the same species by Dr. G. S. Brady from the neighbourhood of Tunbridge Wells. This variety was originally distinguished as a separate species by Professor Sars, who reared it out of dried mud sent him from South Africa.³ Baird's *D. schoefferi* is identified by Brady with the earlier *D. magna*, Straus, which he refers to a new genus *Dactylura*, but this is cancelled by Lilljeborg, who identifies Baird's species and that of Straus with the yet earlier *D. pennata* (O. F. Müller). As to Baird's *D. psittacea*, Brady says, it 'is quite unknown to me, though noted by some continental authors.'⁴ Lilljeborg confesses to have confused it at first with Baird's later *D. atkinsoni*, but now describes and figures it under its own name, with the recognition that Jules Richard had already distinguished it from *D. atkinsoni* in exemplary

¹ *British Entomostraca*, p. 29.

² Loc. cit. pp. 93, 95.

³ Brady, *Nat. Hist. Trans. Northumberland, Durham, and Newcastle-upon-Tyne*, xiii. pt. 2, 225 (1898).

⁴ Loc. cit. 244.

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fashion. *D. obtusa* is regarded by Lilljeborg as nothing but one of the numerous varieties of *D. pulex*, and since *D. propinqua* is described as 'in general character intermediate between *D. pulex* and *D. obtusa*,' it scarcely needs a distinctive name. Brady says, 'I have seen but one male of this form . . . this has the short abdominal processes characteristic of *D. obtusa*, and appears to be the prevailing form of *Daphnia* in Kent and Sussex. In the spring of 1897 I found it abundantly . . . in ponds at Bayhall, Tunbridge Wells.'¹ The same family contains *Simocephalus vetulus* (O. F. Müller) found at Chislehurst by Mr. Scourfield and by myself at Tunbridge Wells, and two species of *Moina*, *M. rectirostris* (O. F. Müller) and *M. branchiata* (Jurine), both recorded by Baird from a "Pond on Blackheath."² Recently *Simocephalus vetulus* has been renamed *Simosa vetula* by the Rev. Dr. Norman, its older generic name being preoccupied.

Of the next family Bosminidae Mr. Scourfield reports *Bosmina cornuta* (Jurine) from Keston. By Lilljeborg this species is identified with the earlier *longirostris* of O. F. Müller. In this family, it may be observed, the intestine is simple, and thereby it is distinguished from the Daphniidae, in which the intestine has in front two caecal processes, and from the Chydoridae, in which the intestine is looped. Unfortunately our third family, the Macrotrichidae, occasionally have the caecal processes and sometimes have a loop to the intestine, but often are devoid of these characters. By this inconstancy they seriously detract from the value of this internal apparatus as a help to classification. To the Macrotrichidae belongs *Ilyocryptus sordidus* (Liévin), found by Mr. Scourfield at Orpington. The species of this genus have neither the anterior caeca nor the median loop. While the habit of hiding in the mud is expressed by the generic title, the specific name *sordidus* intimates that the bearer of it does not escape the ordinary consequence of touching what is foul. This is not quite a matter of course with crustaceans, for some manage to emerge from mud with their coats exquisitely glossy, although the same mud clings to their dead bodies very tenaciously.

The Chydoridae supply the county with several species. The ubiquitous little *Chydorus sphaericus* (O. F. Müller) is reported by Mr. Scourfield from Hayes, Keston, Gravesend, Orpington and Chislehurst, and has also been found at Great Bayhall, near Tunbridge Wells. The slightly larger *C. globosus*, Baird, is reported by Baird from 'Pond near Bexley Heath, July.'³ The same author records his own *Alona ovata* from 'Pond on Blackheath, April 1848.'⁴ Of the same genus Mr. Scourfield reports *A. quadrangularis* (O. F. Müller) from Orpington, *A. tenuicaudis*, Sars, from Keston, *A. rectangula*, Sars, also from Keston, and *A. guttata*, Sars, from Chislehurst. The first of these five is exposed to a twofold doubt. Brady and Norman make it doubtfully a synonym of *A. rostrata* (Koch). Lilljeborg in his 'Cladocera Sueciae' takes no notice of Baird's *ovata*,

¹ Brady, *Nat. Hist. Trans. Northumberland, Durham, and Newcastle-upon-Tyne*, xiii, pt. 2, 226 (1898).

² *British Entomostraca*, pp. 101, 102.

³ Loc. cit. p. 128.

⁴ Loc. cit. p. 133.

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but speaks of Koch's *rostrata* as hovering between the genera *Alonella* and *Alona*, using however for the latter genus the preoccupied name *Lynceus*. *Alonella nana* (Baird) is reported from Keston by Mr. Scourfield. As its length is given by Norman and Brady at $\frac{1}{10}$ of an inch,¹ one may credit their statement that it is the smallest of our British Cladocera, as also Lilljeborg's that it is the smallest of the Swedish. *Graptoleberis testudinaria* (S. Fischer) by its coarsely reticulated valves justifies the generic name of 'scribble-skin.' Its specific name indicates its likeness on a very diminutive scale to a tortoise, the effect being produced in a lateral view by the arched upper or dorsal margin of the valves and the broadly protruding rostral part of the head. The species was taken by Mr. Scourfield at Keston, who at the same place obtained *Peracantha truncata* (O. F. Müller). This I have myself taken at Tunbridge Wells. It may be of use to remember that in this family the second antennae have both branches three-jointed, whereas in the other three families one branch is four-jointed, the single genus *Bosminopsis* excepted.

The Ostracoda offer a study in some respects more difficult than that of the Cladocera, inasmuch as the valves are little or not at all transparent and are capable of tightly shutting in the whole body. Of the two tribes now accepted, Myodocopa and Podocopa, the former are marine and have not as yet attracted attention in the sea about Kent. Of the latter, which include a very large number of freshwater forms, many have been recognized in this county. The local species are distributed among two out of the five families of this division, the Cyprididae and Cytheridae. Belonging to the first of these are the following species of seven genera. *Cypris fuscata* (Jurine) is reported by Mr. Scourfield from Chislehurst, is found in ponds near Tunbridge Wells, and is one of the most abundant British species. *C. incongruens*, Ramdohr, which includes *C. aurantia* (Jurine), so named from the orange tints of its valves, has been found in Kent by Professor Rupert Jones and is recorded by Baird from Blackheath and Dover.² *C. virens* (Jurine), common in small ponds and ditches everywhere, has been taken by Mr. Scourfield at Chislehurst and by myself near Tunbridge Wells. *Cypria ophtbalmica* (Jurine) is reported by Mr. Scourfield from Keston, Gravesend, and Orpington. Brady and Norman speak of it as 'one of the commonest of British species, occurring everywhere in ditches, ponds, and lakes, both freshwater and brackish.'³ In 1868 Dr. Brady was happy to have found one male specimen of this species. In 1896, however, he and Dr. Norman give 'males common' as a characteristic of the genus *Cypria*, but of *Cypris* they say, 'until quite lately males in this genus were unknown; and up to the present time no male has been found in the British Islands.'⁴ *Cyclocypris serena* (Koch) is recorded by Scourfield from Chislehurst, and

¹ *Natural History Trans. Northumberland, etc.*, 397 (1867).

² See G. S. Brady, *Monograph of recent British Ostracoda*, in *Trans. Linn. Soc. London*, xxvi. pt. 2, 363 (1868). A reference to this valuable monograph may be understood for localities of Kentish Ostracoda here quoted, when no other authority is specified.

³ *Transactions Royal Dublin Society*, ser. 2, iv. 69 (1889).

⁴ *Loc. cit.* ser. 2, v. 719, 720 (1896).

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C. laevis (O. F. Müller) from Orpington. In this genus males are common. Its species have the shell excessively tumid, contrasting with the sub-compressed form in *Cypria*. Of *Cypridopsis vidua* (O. F. Müller), since referred to a new genus *Pionocypris*, Brady in 1868 says, 'I have specimens from many different localities, ranging from Kent to Dumfriesshire,' and *Cypridopsis aculeata* (Lilljeborg) he records as obtained by Rupert Jones at 'Gravesend, in brackish water.' With the latter was taken a species at that time called *Cypris gibba*, Ramdohr, which, Dr. Brady says, 'seems to be an almost ubiquitous species, but is liable to escape observation, owing to its habit of escaping on the bottom or embedding itself in the mud or soft clay.' This has since been transferred to a new genus *Ilyocypris*, 'the mud Cypris,'¹ and the species itself has been split into two, *I. gibba*, Ramdohr, and *I. bradyi*, Sars,² but which of the two or whether both should be credited to Kent I am not in a position to decide. Along with the preceding another species of similar habits was taken, *Candona candida* (O. F. Müller), of which Dr. Brady remarks, 'some large adult specimens, collected by Professor T. Rupert Jones in slightly brackish water at Gravesend, exhibit near the posterior extremity of the shell a peculiar reticulated pattern, very similar to that of *Cytherideis nobilis* (Brady), a marine species found on the coast of Crete,' the two species being also not unlike in shape and general appearance. 'The males of *C. candida*,' he says, 'are much more abundant than those of any other species of the family; they appear, indeed, to be almost as plentiful as the females.' *Candona lactea*, Baird, is recorded from 'freshwater pond, at Charing, Kent.' Brady observes that 'the animals belonging to this genus have no swimming power, and are very sluggish in their movements, crawling leisurely on the bottom, or on the stems of water plants or sometimes burying themselves in the mud.' On the other hand in the next genus, *Pontocypris*, which as the name implies is marine, the animals are quite well able to swim, though in practice they appear 'to delight especially in a muddy bottom, and probably do not stir far away from it.' *P. trigonella*, Sars, was taken by Mr. E. C. Davison in the estuary of the Thames.

The family Cytheridae supplies numerous species distributed among ten genera. As distinguished from the preceding family, in which the shell is generally thin, horny, and tolerably smooth, and the eyes when present are usually confluent, here the shell is generally hard, calcareous, and rough, and the eyes when present are more or less separated. In the extensive genus *Cythere* we have *C. lutea*, O. F. Müller, from the North Foreland, of which the *C. viridis* of Brady's *Monograph*, from Girdler Sand, Thames, and the *C. reniformis* of Baird, from North Foreland, near Dover, are synonyms;³ *C. confusa*, Brady and Norman, from Margate;⁴ *C. pellucida*, Baird, from the Girdler Sand in the

¹ *Transactions Royal Dublin Society*, ser. 2, iv. 106.

² Loc. cit. ser. 2, v. 727.

³ Brady and Norman, *Transactions Roy. Dublin Society*, ser. 2, iv. 125.

⁴ Loc. cit. iv. 126, 127.

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estuary of the Thames, and from the same locality *C. tenera*, Brady; *C. albomaculata*, Baird, taken at Whitstable by Rupert Jones, at Girdler Sand (Thames) and Margate by E. C. Davison; *C. gibbosa*, Brady and Robertson, found by those authors in the Thames Estuary; *C. tuberculata* (Sars) from Margate; *C. villosa* (Sars), obtained by Davison at Margate and Girdler Sand; *C. navicula* (Norman), of which Brady recognized his *Cythere fidicula* as a synonym, from the estuary of the Thames and various other places, but in all of them rare, with a specific name suggestive of the form, which Norman thus describes, 'ventral aspect boat-shaped, the resemblance most striking; centrally depressed at the juncture of the valves; bow moderately sharp, of good breadth of beam, sculptured with raised, threadlike concentric lines, representing the timbers, while the small nodulous processes stand for the thole-pins. The dorsal and end views bear out the illusion, the former representing a boat viewed from below, with a well-marked keel, and the latter being triangular, with gently rounded sides; ¹ *C. fuscata*, Brady, found by Brady and Robertson in the Thames, ² *C. antiquata* Baird from the Thames ³ and *C. whitei* (Baird) from the Girdler Sand. ⁴

Cytheridea papillosa, Bosquet, has been found in the Thames Estuary, by Davison, and of the same genus *C. elongata*, Brady, in Pegwell Bay by Rupert Jones, and in shell sand from the Thames by Dr. Brady; *C. torosa* (Jones) has been found at Gravesend by Professor Jones, at Girdler Sand by Davison, and in shell sand from Pegwell Bay by Brady; *C. lacustris* (Sars) was obtained from the Thames Estuary by Brady and Robertson. ⁵ *Eucythere declivis* (Norman), of which *E. argus* (Sars) is a synonym, is recorded from 'Girdler Sand,' this like most of the specimens from that locality having been collected by Mr. E. C. Davison. *Loxoconcha impressa* (Baird) 'in the shell sand from the Girdler Sand' (Thames) 'is described as one of the commonest of British species.' The generic name means 'oblique shell,' and in accord with this Dr. Brady observes, 'the genus is well characterized by the oblique "peach-stone" outline of the carapace.' To the same genus belong *L. guttata* (Norman) from Girdler Sand, Thames, and off Dungeness Bay; *L. viridis* (O. F. Müller), of which *L. elliptica*, Brady, from Girdler Sand, is now recognized as a synonym; and *L. tamarindus* (Jones) from Margate and 'in shell sand, Girdler Sand.' *Xestoleberis aurantia* (Baird) is reported by Brady and Norman from the estuary of the Thames and from off Dungeness Bay. This species shows 'colour deep brownish orange, or sometimes white; a very conspicuous black or deep crimson spot in front of the eyes.' The genus, Dr. Brady says, 'is chiefly distinguished by the peculiar form of the carapace, which is very low and pointed in front, elevated and tumid behind, in these respects offering a direct contrast to the genus *Eucythere*.' It has the 'shell very smooth and polished, ornamented with small round distinct

¹ Brady and Norman, *Transactions Roy. Dublin Society*, ser. 2, iv. 143.

² Loc. cit. iv. 148.

³ Loc. cit. 168.

⁴ Loc. cit. 169.

⁵ See *Monograph of Post-tertiary Entomostraca*, 179 (1874).

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papillae.' The generic name signifies 'polished skin'. *Cytherura striata*, Sars, one of the commonest of its genus, 'occurring in tidal pools, as well as in all depths of water round the British coasts, and extending commonly into the estuaries of rivers on the east coast of England,'¹ is specially reported from Girdler Sand; *C. similis*, Sars, is recorded under the synonym *C. propinqua* by Brady and Robertson from the Thames Estuary;² *C. producta*, Brady, one of the less common species, is reported by Brady and Norman from the Thames and Dungeness Bay,³ and by the same authors their *C. simplex* from the 'Thames Estuary, 7 fathoms.'⁴ As to the genus *Cytherura* Brady says that its species are the smallest of all the Ostracoda. *Bythocythere recta* (Brady) has been obtained by Dr. Brady in Dungeness Bay.⁵ *Sclerochilus contortus* (Norman) was found by Davison at Margate and 'in shell sand, Girdler Sand.' In this genus the elongated valves are 'very hard, especially towards the margins,' thus accounting for the generic title 'hard-lip.' Dr. Brady in 1868 says, 'in outward appearance the one species belonging to this genus is scarcely separable from the following (*Paradoxostoma*); but the structure of the animal shows an apparent transition from the *Cythere* type to that of *Paradoxostoma*. This is more especially evident in the mandibles and mouth.' On the other hand in 1889 Brady and Norman separate from the Cytheridae a new family Paradoxostomatidae for species which among other characters have the valves thin, fragile, smooth, imperfectly closed in front, and the mandibles stiliform.⁶ G. O. Sars (1891), however, and G. W. Müller (1894) think the additional family unnecessary, or only to be accepted with modifications as a subfamily of the Cytheridae. *Paradoxostoma variable* (Baird), reported from Dover by Baird⁷ and obtained from Girdler Sand, Thames, by Davison, is exposed to some doubt by the remark of Dr. G. W. Müller that *P. variable* is obviously a collective name for numerous species, some of which can only be distinguished by minute anatomical details.⁸ *P. abbreviatum*, Sars, *P. ensiforme*, Brady, and *P. flexuosum*, Brady, have all been obtained from Girdler Sand, and the last also from Dungeness Bay.⁹

For the Copepoda of the county the authorities are not very numerous. Among those who have published results of their researches, the foremost is Mr. Lubbock (Lord Avebury), who in 1863 records seven species of *Cyclops* from Kentish ponds. As to the family in general, he says: 'Considering that they are among the commonest inhabitants of our fresh waters, that probably there is not a weedy pond in the country which does not contain two or three species, it is somewhat remarkable that the genus should have been so completely

¹ *Transactions Roy. Dublin Society*, ser. 2, iv. 196.

² *Annals and Magazine of Natural History*, ser. 4, v. 25 (1870).

³ *Transactions Royal Dublin Society*, ser. 2, iv. 199.

⁴ *Loc. cit.* p. 201.

⁵ *Loc. cit.* p. 222.

⁶ *Loc. cit.* p. 67.

⁷ *British Entomotraca*, 170.

⁸ *Fauna und Flora des Golfes von Neapel*, Ostracoden, 313 (1894).

⁹ *Transactions Roy. Dublin Society*, iv. ser. 2, 237.

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neglected by our English zoologists ; and yet I am not aware that any one has written on the freshwater Cyclopidae of Great Britain since the appearance of Dr. Baird's work, or has attempted to compare our English forms with those described by the foreign carcinologists, and especially by Claus and Fischer.¹ Since then the comparison has been carried further back to the works of Koch and Jurine, with the result that specific names accepted in 1863 have undergone various displacements. Beginning with the species of *Cyclops* that have the first antennae seventeen-jointed, we find that *C. coronatus*, Claus, recorded by Lubbock from Chislehurst, is transferred by Brady to *C. signatus*, Koch, but Mr. Scourfield, who has found the same species at Keston, adopts for it the admittedly earlier name, *C. albidus* (Jurine). This species has a serrated rib or crest on the last joint of the first antennae, while *C. tenuicornis*, Claus, recorded by Lubbock from Chislehurst, with the remark that 'this species is very nearly allied to *C. coronatus*, if indeed distinct,' has the crest simple. The smooth crest, however, is now supposed only to represent a slightly earlier stage in the animal's development.² *C. strenuus*, Fischer, is reported by Scourfield from Hayes and Keston. For this species the same name is adopted by Brady, though he gives as synonyms the earlier names, *Monoculus quadricornis rubens*, Jurine, and *Cyclops pictus*, Koch, as well as the later *C. brevicaudatus*, Claus, which Lubbock found 'common at Chislehurst,' and *C. clausii*, Lubbock, which that author found 'common in a pond on Farnborough Common in Kent, May 1861 ; and also in a horse pond at Reigate, in July ; at Chislehurst Common, in February, March, April, and September.' Lubbock mentions that 'the male seizes hold of the penultimate legs of the female with his prehensile antennae,' and that 'the egg-bags are at first greenish, but gradually become light pink.' By Scourfield *C. leuckarti*, Claus, is reported from Keston ; *C. dybowskii* (Landé), from Hayes ; *C. viridis* (Jurine), var. *gigas*, Claus, from Hayes, Keston, Gravesend and Chislehurst, and *C. bicuspidatus*, Claus, var. *lubbockii*, Brady, from Gravesend. *C. brevicornis*, Claus, recorded by Lubbock as 'common in ponds at Farnborough and Chislehurst, in Kent, etc.,' is now identified with *C. viridis* (Jurine). Of the species which have the first antennae twelve-jointed, *C. serrulatus*, Fischer, is recorded from Kent by Lubbock, who mentions it as one of the smallest species of the genus, apparently hardy, and living well in confinement. By Scourfield it is reported from Hayes, Keston, Gravesend and Orpington. *C. phaleratus*, Koch, with ten-jointed first antennae, is recorded by Lubbock from Chislehurst, but under the later name *C. acanthocarpoides*, Fischer. *C. fimbriatus*, Fischer, with the first antennae only eight-jointed, is reported by Scourfield from Keston. Of the family Diaptomidae *Diaptomus castor* (Jurine) and *D. gracilis*, Sars, are reported by Scourfield from Chislehurst, and had been previously recorded from Kent by Lubbock, who supposing the second species

¹ Transactions Linn. Soc. London, xxiv. pt. 2, 197 (1863).

² See Brady, Natural History Transactions, Northumberland, etc. xi. 72 (1891).

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to be new named it *D. westwoodii*. In this genus the first antennae are twenty-five jointed, the right one in the male being prehensile. *Eurytemora affinis* (Poppe) and *E. lacinulata* (Fischer) have been found by Scourfield at Gravesend. The first antennae are twenty-four jointed, with the clasper on the right. Of the family Arpacticidae *Canthocampus staphylinus* (Jurine) is reported by Scourfield from Chislehurst, and *Moraria andersonsmithi*, T. and A. Scott, from Keston. The last-named authors say that the genus *Moraria* was instituted to include an interesting Arpactid from Loch Morar, Inverness-shire, 'having characters connecting the fresh-water species *Attheyella cryptorum*, Brady, with the marine *Cylindropsyllus laevis*, Brady.'¹ 'The anterior antennae in both male and female are short, stout, and seven-jointed, the male antennae being hinged between the fourth and fifth joints, and adapted for grasping.'² Mr. Scourfield, writing to me, 17 May 1902, says, 'I also enclose a summary of all my records of fresh and brackish water Entomostraca from Kent. I am sorry it is not longer, but it has happened that I have not collected much in Kent. There are, however, several interesting things in the list, e.g. the two species of *Eurytemora*, *Cyclops dybowskii*, and *Moraria andersonsmithi*.' It can scarcely be necessary to point out how largely Mr. Scourfield, by his generous supply of unpublished lists, has contributed to the completeness of this report on the Crustacea of the county.

Of parasitic and semiparasitic Entomostraca many are Copepoda which attach themselves with more or less freedom or fixity to fishes, and are on that account called 'fish-lice.' How large a number of parasitic Crustacea in general might be added to the catalogue of the Kentish fauna can be with certainty inferred from some passages in *England's Topographer*, in which their hosts are mentioned. Thus Mr. Ireland says, 'The Medway abounds in fish; particularly carp, perch, tench, pike, dace, chub, roach, and gudgeons; and but rarely a salmon is caught weighing twelve or fourteen pounds: that fish formerly abounded in this river, as several manors belonging to the priory of Rochester were compelled to furnish one or more annually, for the table of the monks: and below Rochester, the finest and largest smelts are caught, as well as soals, flounders, dabs, thornbacks, maids, etc. In former times the sturgeon was so abundant in the stream that the Bishop of Rochester claimed a duty from the same, which constituted a considerable part of his revenue, as second to the Archbishop; another being also paid to the King.' 'The Cray abounds in trout of the finest flavour, colour and size.' Elsewhere he tells us that 'In the year 1774 a most remarkable fish was caught on Faversham Flats, called *mola salviani*, or the sun fish, which weighed about nineteen pounds and a half, and was two feet in diameter. This fish is very rarely met with in our narrow seas,' and in a 'Chronology of remarkable events relating to Maidstone,' one entry is, 'R. whale and two porpusses taken in

¹ *Annals and Magazine of Natural History*, ser. 6, xi. 213 (1893).

² T. Scott in *Eleventh Annual Report of the Fishery Board for Scotland*, pt. 3, 228 (1893).

CRUSTACEANS

the Medway.’¹ The sunfish, which is now called *Orthogoriscus mola*, is a little paradise for parasites, but also the Right Whale carries its amphipod *Cyamus*, the carp its branchiopod *Argulus*, the sturgeon its strange-looking copepod *Dichelestium*, and so on through the list might be mentioned one eccentric form after another, which is only waiting for a chronicler to give it the right of taking its place in the Kentish fauna.

Something still remains to be said of the Thyrostraca, better known as cirripedes and better still as barnacles, if betterness of knowledge can be reckoned by the familiarity of a name. Of the sessile species the county may at least claim Darwin’s *Balanus improvisus*, since he says of it, ‘This species, as far as my experience goes, is commoner on the shores of Kent than on other parts of England: the first specimens which I met with, I owed to the kindness of Mr. Metcalf; they were attached to wooden stakes from Herne Bay, together with a single specimen of *B. crenatus*: I have seen other specimens from near Woolwich, from the Kentish oyster-beds, from Sandwich and from Ramsgate. . . . This species is often attached to wood. At Ramsgate, the specimens were attached to a small coasting vessel, and they must have been immersed five or six feet; they were associated with *B. crenatus*, and with a few of *B. balanoides*.’ At Monte Video Darwin found this species capable of living in water perfectly fresh, with a chance at high tide of having a bath in slightly brackish water. He remarks on the singularity of a species capable of living in fresh water and likewise in the saltiest seas, when ‘even brackish water is a deadly poison to several, probably to most, species of the genus.’² Of *B. crenatus*, Bruguière, Darwin says: ‘I have received specimens from all parts of the coast of Great Britain and Ireland, generally attached to crustacea and mollusca, and never hitherto from rocks uncovered by the tide. . . . At Ramsgate, in Kent, I saw a rudder of a ship, in which the two or three upper feet were thickly coated with *B. balanoides*, and the two or three lower feet with *B. crenatus* and *improvisus* mingled, together with a few of *B. balanoides*.’³ This latter species often crowds the shore between extreme tide-marks, but Darwin doubts whether it ever lives below the lowest ebb.⁴ He also points out that ‘When a specimen is disarticulated, our present species can at once be distinguished from *B. crenatus* (and from *B. improvisus*) by its membranous basis, and by the solid or cancellated walls, which are rarely permeated by regular tubes or pores; and the walls when porose are not internally ribbed.’⁵ From *B. crenatus* the species *B. improvisus* is distinguished externally by having the edges of the radii ‘much smoother and rounded, and the whole shell less rugged, internally by the porose basis, the presence of an adductor ridge on the under side of the scutum, and the graduated teeth on each side of the central notch in the labrum.’⁶

¹ *England’s Topographer*, i. 105 (1828); ii. 586 (1829); iii. 696 (1829).

² *Monograph of the Balanidae*, 252 (Ray Soc. 1854).

³ Loc. cit. 264.

⁴ Loc. cit. 272.

⁵ Loc. cit. 271.

⁶ Loc. cit. 265.

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It should be understood that the scuta and terga are two pairs of valves forming the operculum or lid of a *Balanus* ; the radii are the modified sides of the shell's immovable compartments ; they overlap the alae which are also lateral protuberances of the walls but are overlapped instead of overlapping.

Of the strange parasitic Thyrostraca it is quite clear that at least one species has been found abundantly in Kent. This follows from the remarks appended by Bell to his account of the crab *Portunus marmoreus*, which he personally appears to have procured only in this county. He says, 'There is another fact relative to this species which is worth recording, and that is, the extent to which they are infested with a remarkable parasite, occupying the space between the folded abdomen and the sternum, and having the *prima facie* appearance of a bag of immature eggs. Both males and females are equally obnoxious to it, and from its size and situation it must present an insuperable barrier to impregnation. It consists principally of a mass of minute eggs, which are arranged in bundles attached to filaments, like bunches of grapes ; the alimentary canal passes directly through the body, the mouth being attached to the intestine of the crab, which it pierces near its extremity, and from which in all probability it derives its nourishment. The anal opening, which is distinct and obvious, is visible without removing the parasite from its position. The whole is of a rounded trihedral form, and is covered by a tough but thin integument. I have occasionally found it infesting *Garcinus maenas*, but never in such numbers as in the present species.'¹ It is difficult to understand how Bell could have written this account without calling to mind that the parasite which he had observed on the common shore crab had been already described by J. Vaughan Thompson in 1836 as *Sacculina carcini*. There is now a considerable literature concerned with the structure and life history of the Sacculinidae. It cannot be taken for granted from superficial resemblance that these parasites when found on different hosts belong to one and the same species.

The foregoing catalogue of Kentish crustacea may be deemed a fairly long one and well diversified. It is so. Nevertheless the naturalist will easily understand that in every direction some, and in many directions very large, amplification of it may be predicted as the result of future researches.

¹ *British Stalk-eyed Crustacea*, 108.

FISHES

The data from which the present list is drawn are derived from three sources : Boys' *Fishes of Sandwich*, 1792, the handbook to Dover, prepared for the meeting of the British Association in 1899, and containing a list of the fishes, by Mr. Sydney Webb, and Dr. J. Murie's *Thames Estuary Sea Fisheries*, part i., 1903. The names of freshwater species are prefixed with an asterisk ; two asterisks denote occurrence in both fresh and salt water.

TELEOSTEANS

ACANTHOPTERYGII

- *1. Perch. *Perca fluviatilis*, Linn.
- **2. Sea Bass. *Morone labrax*, Linn. (*Labrax lupus*, Day).
3. Maigre. *Sciæna aquila*, Lacep.
Taken off Margate in October, 1843.
4. Common Sea Bream. *Pagellus centrodontus*, Delaroché.
5. Pandora Sea Bass. *Pagellus erythrinus*, Linn.
6. Red Mullet. *Mullus barbatus*, Linn.
7. Ballan Wrass. *Labrus maculatus*, Bl.
8. Baillon's Wrass. *Grenilabrus melops*, Linn.
Specimens from the Thames estuary have been presented to the British Museum by Dr. Murie.
- *9. Miller's Thumb. *Cottus gobio*, Linn.
10. Father-lasher or Bull-head. *Cottus scorpius*, Linn.
11. Lucky Proach. *Cottus bubalis*, Euphr.
12. Four-horned Cottus. *Cottus quadricornis*, Linn.
13. Grey Gurnard. *Trigla gurnardus*, Linn.
14. Streaked Gurnard. *Trigla lineata*, Gmel.
15. Red Gurnard or Elleck. *Trigla cuculus*, Linn.
16. Sapphirine Gurnard or Tubfish. *Trigla birundo*, Linn.
17. Piper. *Trigla lyra*, Linn.
18. Dogge or Armed Bullhead. *Agonus cataphractus*, Linn.
19. Lump-sucker. *Cyclopterus lumpus*, Linn.
20. Sea-snail. *Liparis vulgaris*, Flem.
21. Diminutive Sea-snail. *Liparis montagui*, Donovan.
22. Spotted Goby. *Gobius minutus*, Gmel.
23. Two-spotted Goby. *Gobius ruthensparri*, Euphr.
24. Willughby's Goby. *Gobius paganellus*, Gmel.
25. Transparent Goby. *Aphia pellucida*, Nardo.
Has been found at the mouth of the Thames by Dr. J. Murie.
26. John Dory. *Zeus faber*, Linn.
27. Boar-fish. *Capros aper*, Linn.
Is often taken singly at Dover.
28. Scad or Horse-mackerel. *Caranx trachurus*, Linn.
29. Pilot-fish. *Naucrates ductor*, Linn.
Individuals are on record from Folkestone, Dover, Ramsgate, and Margate.
30. Tunny. *Thunnus thynnus*, Linn.
In 1801 three were taken off Margate, this being the first record of tunnies on the English coast. Others have since come ashore on the coast of Kent. In May 1880, the skull of one, 10 inches wide, was found at Margate.
31. Mackerel. *Scomber scombrus*, Linn.
32. Sword-fish. *Xiphias gladius*, Linn.
33. Great Weever. *Trachinus draco*, Linn.
34. Lesser Weever. *Trachinus vipera*, Cuv. and Val.

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35. Dragonet. *Callionymus lyra*, Linn.
36. Butterfly Blenny. *Blennius ocellaris*, Linn.

'Has more than once been detected by Mr. E. Horsnail at Dover' according to Mr. Sydney Webb.

37. Butter-fish. *Centronotus gunellus*, Linn.
38. Viviparous Blenny. *Zoarces viviparus*, Linn.
39. Angler or Fishing frog. *Lophius piscatorius*, Linn.
Occasionally captured at Dover.

ANACANTHINI

40. Cod. *Gadus morrhua*, Linn.
41. Haddock. *Gadus æglefinus*, Linn.
42. Bib or Pont. *Gadus luscus*, Linn.
43. Power. *Gadus minutus*, Linn.
44. Coal-fish. *Gadus virens*, Linn.
45. Whiting. *Gadus merlangus*, Linn.
46. Pollack. *Gadus pollachius*, Linn.
47. Hake. *Merluccius vulgaris*, Cuv.
48. Fork-beard. *Phycis blennioides*, Bl. Sch.
49. Lesser Fork-beard. *Raniceps raninus*, Linn.
50. Ling. *Molva vulgaris*, Flem.
51. Five-bearded Rockling. *Motella mustela*, Linn.
52. Three-bearded Rockling. *Motella tricirrata*, Bl.

PLEURONECTOIDEI

53. Halibut. *Hippoglossus vulgaris*, Flem.
54. Turbot. *Rhombus maximus*, Linn.
55. Brill. *Rhombus lævis*, Linn.
56. Common Topknot. *Zeugopterus punctatus*, Bl.
57. Plaice. *Pleuronectes platessa*, Linn.
58. Lemon Dab. *Pleuronectes microcephalus*, Donovan.
59. Dab. *Pleuronectes limanda*, Linn.
*60. Flounder. *Pleuronectes flesus*, Linn.
61. Pole or Long flounder. *Pleuronectes cynoglossus*, Linn.
62. Sole. *Solea vulgaris*, Quens.

The Dover or Kingsdown Soles, it may be observed, command the highest prices on the London market.

63. Thickback. *Solea variegata*, Donovan.
64. Solenette. *Solea lutea*, Risso.

PLECTOGNATHI

65. File-fish. *Balistes caprisкус*, Linn.
A single specimen was captured near Folkestone in 1884.
66. Sun-fish. *Orthogoriscus mola*, Linn.

PERCESOCES

- **67. Thin-lipped Grey Mullet. *Mugil capito*, Cuv.
**68. Thick-lipped Grey Mullet. *Mugil chelo*, Cuv.
69. Atherine. *Atherina presbyter*, Jen.
Stated by Day to be absent from Kent, but reported from Dover by Mr. Sydney Webb, and from the Thames Estuary by Dr. Murie.
70. Larger Launce or Sand Eel. *Ammodytes lanceolatus*, Lesauv.
71. Lesser Launce. *Ammodytes tobianus*, Linn.
72. Garfish. *Belone vulgaris*, Flem.
73. Flying Fish. *Exocoetus volitans*, Linn.
Murie records the capture of an example in the Medway at Rochester, in September 1898.

HEMIBRANCHII

- **74. Three-spined Stickleback. *Gastrosteus aculeatus*, Linn.
*75. Ten-spined Stickleback. *Gastrosteus pungitius*, Linn.
76. Fifteen-spined Stickleback. *Gastrosteus spinachia*, Linn.

SELENICHTHYES

77. Opah or Moon-fish. *Lampris luna*, Linn.
Of exceptional occurrence.

LOPHOBRANCHII

78. Broad-nosed Pipe-fish. *Siphonostoma typhle*, Linn.
79. Greater Pipe-fish. *Syngnathus acus*, Linn.
80. Snake Pipe-fish. *Nerophis æquoreus*, Linn.
81. Straight-nosed Pipe-fish. *Nerophis ophidion*, Linn.
82. Sea-horse. *Hippocampus antiquorum*, Leach.
Frequently taken along the Sandwich Flats.

FISHES

HAPLOMI

- *83. Pike. *Esox lucius*, Linn.

OSTARIOPHYSI

- *84. Carp. *Cyprinus carpio*, Linn.
 *85. Crucian Carp. *Cyprinus carassius*, Linn.
 *86. Gudgeon. *Gobio fluviatilis*, Flem.
 *87. Rudd. *Leuciscus erythrophthalmus*, Linn.
 *88. Roach. *Leuciscus rutilus*, Linn.
 *89. Chub. *Leuciscus cephalus*, Linn.
 *90. Dace. *Leuciscus dobula*, Linn. (*L. vulgaris*, Day).
 *91. Minnow. *Leuciscus phoxinus*, Linn.
 *92. Tench. *Tinca vulgaris*, Cuv.
 *93. Bream. *Abramis brama*, Linn.
 *94. Bleak. *Alburnus lucidus*, H. and K.
 *95. Loach. *Nemachilus barbatulus*, Linn.

MALACOPTERYGII

- **96. Salmon. *Salmo salar*, Linn.

- **97. Trout. *Salmo trutta*, Linn.
 **98. Houting. *Coregonus oxyrhynchus*, Linn.
 Has been taken in the Thames estuary.
 99. Smelt. *Osmerus eperlanus*, Linn.
 100. Argentine. *Argentina sphyæna*, Linn.
 Recorded by Boys.
 101. Anchovy. *Engraulis encrasicolus*, Linn.
 A casual visitor.
 102. Herring. *Clupea harengus*, Linn.
 The true 'Whitebait' is the young of the herring.
 103. Pilchard or Sardine. *Clupea pilchardus*, Linn.
 104. Sprat. *Clupea sprattus*, Linn.
 **105. Shad. *Clupea alosa*, Linn.
 **106. Thwait. *Clupea finta*, Cuv.

APODES

- **107. Eel. *Anguilla vulgaris*, Turt.
 108. Conger. *Conger vulgaris*, Cuv.

GANOIDS

- **109. Sturgeon. *Acipenser sturio*, Linn.

CHONDROPTERYGIANS

110. Porbeagle. *Lamna cornubica*, Gmel.
 111. Hammerhead. *Sphyrna zyæna*, Linn.
 Has been seen at Dover in 1887, according to Mr. Sydney Webb. Had previously been recorded by Boys.
 112. Rough Hound, or Small-spotted Dogfish. *Scyllium canicula*, Linn.
 113. Nurse-Hound, or Large-spotted Dogfish. *Scyllium stellare*, Linn. (*S. catulus*, Day.)
 114. Thrasher. *Alopias vulpes*, Gmel.
 First recorded by Boys. Specimens have been captured off Folkestone in 1867, 1868, and 1869.
 115. Smooth-Hound. *Mustelus lævis*, Flem. (*M. vulgaris*, Day).
 116. Tope. *Galeus vulgaris*, Flem.
 117. Picked Dogfish. *Acanthias vulgaris*, Risso.
 118. Monk-fish or Angel. *Rhina squatina*, Linn.
 119. True Skate. *Raia batis*, Linn.
 120. Thornback. *Raia clavata*, Linn.
 121. Long-nosed Skate. *Raia oxyrhynchus*, Linn.
 122. Homelyn. *Raia maculata*, Montagu.
 123. Sting Ray. *Trygon pastinaca*, Linn.
 124. Eagle Ray or Whip Ray. *Myliobatis aquila*, Linn.
 Occasionally seen at Dover, according to Mr. Sydney Webb.

CYCLOSTOMES

- **125. Sea Lamprey. *Petromyzon marinus*, Linn.
 **126. Lampern. *Petromyzon fluviatilis*, Linn.

REPTILES AND BATRACHIANS

The Reptile fauna of this county is an extremely poor one, only the species generally distributed over England being on record. The Sand Lizard (*Lacerta agilis*) and the Smooth Snake (*Coronella austriaca*), which occur in some localities in Sussex, Surrey, Hampshire and Dorsetshire, are absent, and the more widely distributed Palmated Newt (*Molge palmata*) has not been observed in Kent, although no doubt it will be found some day. We must therefore content ourselves, at present, with the meagre list of 4 reptiles and 5 batrachians. The Natter-jack Toad (*Bufo calamita*) which appears on the list, occurred in days gone by on Blackheath, and according to Mr. Sydney Webb is still found near Dover, but not in abundance.

REPTILES

1. Common Lizard. *Lacerta vivipara*, Jacq.
2. Slow-worm. *Anguis fragilis*, Linn.
3. Common or Ringed Snake. *Tropidonotus natrix*, Linn.
4. Viper or Adder. *Vipera berus*, Linn.

BATRACHIANS

1. Common Frog. *Rana temporaria*, Linn.
2. Common Toad. *Bufo vulgaris*, Laur.
3. Natter-jack Toad. *Bufo calamita*, Laur.
4. Great crested Newt. *Molge cristata*, Laur.
5. Common Newt. *Molge vulgaris*, Linn.
(*Triton punctatus*, Latr.).

BIRDS

Before enumerating the birds that are found in Kent, a brief survey of the principal features of the county in relation to its bird life is desirable, since natural conditions influence to a great extent the distribution of birds.

By possessing a wealth of water, marshland, woods and cultivated districts, Kent is one of the richest counties in England as regards bird life. Its fertile undulating landscape, running in and out from woods and copses to park, meadow and cultivated crop land, hop land and fruit orchards, intersected with hedgerows, which, to borrow an expressive phrase, produce 'a well upholstered look,' have earned for Kent the name of 'the Garden of England.' And, when to our county the summer brings the hosts of migrants that make their haunts in the sheltered woods and dells, and fill the country-side with melody, one would think that Kent might also be well called the Garden of Song.

The heart of Kent contains principally the district known as the Weald (forest tract), the site in former times of dense impenetrable forests. In this district many woods of considerable size, copses and wooded dells (locally known as 'shaws' and 'gills') are to be found, interspersed with timbered parks, young plantations of larch and fir, grass land, hop land and arable fields.

During the summer months the woods with their quiet streams, moist-breathing meadows bordering the copses, and stout hedgerow bottoms become the sanctuary of many of our warblers. In these localities the nightingale, blackcap-warbler, willow-warbler, chiffchaff, white-throat and lesser whitethroat are to be found nesting; and in the fir and beech-grown parts the wood-wren—that daintiest and prettiest of our warblers—may be met with, while in the cooler depths of shade and thicket the grasshopper-warbler makes a home.

The ranks of many of these summer migrants have greatly increased during the past few summers owing to the heavy plagues of caterpillars that have been experienced in many districts. The small oak-green caterpillar (*Tortrix viridana*), which every season mercilessly strips many of our oak trees, forms a favourite food, especially of the two white-throats, blackcap and garden-warblers.

While these summer denizens of our woods are on the increase, our birds of prey are steadily decreasing. This fact must be put down to cultivation and the large increase in game rearing, and the consequent war waged against them by gamekeepers. For example, in the beginning of the eighteenth century the kite, now extinct in the county, was common. In those days places were rough and wild, cattle and sheep

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were allowed to remain and rot where they died, and their carcasses afforded ample food for these carrion-eating birds. But now farms have sprung up over the whole land, the pasture fields are well kept, and all cattle that die are carefully buried ; an observation which applies to the raven, now a rare bird in the county.

Next in order of rarity may be mentioned the honey buzzard and common buzzard, both in danger of becoming lost to Kent, while at the present time the only two hawks still fairly numerous are the kestrel and sparrow-hawk.

Regarding the owls—the tawny owl and long-eared owl, once in danger of becoming scarce, have rallied, owing to the present protection afforded to them.

Before leaving our world of woods another bird is worthy of mention—that is the golden oriole. This bird has not unfrequently occurred in Kent, and may be looked upon as rather more than a passing visitor, since there are at least three authenticated instances of its having bred in the county. There is not a doubt that this handsome species would become an annual breeder with us, provided it were protected from persecution ; and apart from the pleasure to be derived from seeing it in our woods and gardens and hearing its flute-like notes, its presence in the garden would be valuable, since it devours all kinds of caterpillars and other harmful insects.

In mentioning the large woods, we must not omit the part the smaller ones play in the fostering of our wild birds. We refer to the young plantations of larch, fir and chestnut that have sprung up in the county within the last few years.

Owing to these warm coverts, with their beds of thistles and plentiful undergrass, the number of small finches has greatly increased. Flocks of goldfinches hanging about the thistle-down are now common sights ; siskins too, at the fall of the year, put in a brave appearance, while the clear strings of musical notes from a host of linnets and redpolls will often strike upon the ear.

Another interesting fact about the up-growth of these plantations is that they have induced the woodcock to breed in the suitable localities.

Our hop land, which furnishes one of the most conspicuous features of Kentish scenery, influences to some extent our bird life.

In September, before the poles are pulled, swallows and martins throng the gardens, gathering a harvest from the hop-fly and other insects attracted by the bine ; while at a time when insect life is becoming scarce, this supply of food makes all the difference to these departing migrants, and hence our county offers an attractive high road to the *Hirundinidæ* on their migration southward. Then in winter, when hard frost binds the ground and the farmer enriches the hop gardens from the farmyard, flocks of larks and finches invade them from time to time to gain a living.

The next important features of the county to be considered are the shore-line and marshland. The high chalk cliffs about Dover offer a safe

BIRDS

asylum to large colonies of herring-gulls during the breeding season ; while still more interesting is the fact that the peregrine falcon breeds in inaccessible portions of the cliffs. And here, probably, many years ago the chough bred, for it is included in Mr. Boys' list of Kent birds, and we believe that it bred (sparingly) in the neighbouring county of Sussex.

On the north shore-line are Pegwell and Sandwich Bays, localities rich in shore birds. The former forms the mouth of the river Stour, and with its large expanse of mud flats—about two miles in width and nearly the same in length—becomes the resort during winter of many gulls and waders at low water.

Sandwich Bay is flanked by sand hills and has a wide tract of sand and mud flats, visible at low tide. From this place most of the rare birds recorded by Mr. Boys were obtained, and it was here that the Sandwich tern was discovered by him to be a British bird in 1784.

In the south-east corner of Kent from Hythe to Lydd there is a wide expanse of stones, that has been reclaimed from the sea. About Lydd it is interspersed with shallow pools of brackish water and reed-girt ponds. Among the latter are the well-known Hoppen Petts, the only Kentish breeding home of the black-headed gull. This great tract of stones is locally known as the 'Lydd beach.' Its brown surface is here and there relieved by green patches of the creeping sloe, cup-shaped hollies and clusters of the yellow beach poppy. In relation to bird life the Lydd beach, in the days of Knox, was one of the most attractive localities in the county ; but now, owing to the increased firing of both artillery and small arms from the camp at Lydd during the height of the breeding season, and the opening out of a portion of the beach by the Dungeness railway, many interesting species are on the point of disappearing.

The thickknee and Kentish plovers now only breed there sparingly ; the colonies of common and lesser terns have diminished, while the spoonbill and avocet have become rare visitors.

Between Lydd and Rye harbour the tide lays bare a wealth of sand. During migration this coast line is filled with bird voices. At low tide crowds of gulls line the water's edge. At times they raise a cackling chorus, now loud, now soft as a breathing echo. Then away on the sand the rattling cry of the turnstone, the plaintive notes of the ringed plover and the tremulant whistle of the dunlin will fitfully strike the ear. Farther inland, behind the Lydd beach, is the Romney marshland, where, in the days of Dr. Plomley of Lydd, in the 'forties,' both the ruff and bearded tit were found breeding and the great bustard was not uncommon. The other marshes in the county are those about Rainham, near Stourmouth, Wingham and Minster. Like Romney Marsh, all these localities in former days harboured many birds. Owing to the increase of cultivation and drainage, the area of these marshes has been considerably restricted, and consequently the ranks of our marsh-loving birds are much thinned compared with their number in former times.

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In spring, migrants arrive on the south coast; some to stay, others to pass over the county on their way northward to breed. In autumn the return migration begins, and the birds, which have bred in the north, make their way to the south-east portion of the county, about Dungeness, where the crossing to the continent is shortest. About the same time a migrational movement from the south-west to this same point also takes place. The immigrations of the birds to the county from northern Europe and the continent during autumn and winter are few. Kent lies too far south to catch the movement that extends at those seasons across the North Sea to our east coasts.

The local museums are the Folkestone, Margate, Canterbury, Maidstone and Dover collections. Those of the first three places are in poor condition and records are for the most part lost.

In the last named there is the Plomley collection, containing many species obtained by Dr. Plomley from Lydd and Romney Marsh. The private collections I have referred to in my 'History of Kent Birds' are those of the late Mr. Walter Prentis (now at Rochester) of Mr. Oxenden Hammond of St. Alban's Court, Nonington; and of the Rev. Benjamin Austen of Walmer. These contain many rare species, principally obtained from the northern portions of the county. Lastly, my own collection, consisting chiefly of birds from the Weald and the south coast.

In this article I have only given records which I have been able to authenticate. I have omitted a few, elsewhere recorded, which are not in my opinion satisfactory. My best thanks are due to Mr. Meade-Waldo for his assistance in correcting my proofs. I have referred to the following works:—

- Yarrell's *History of British Birds* (ed. 4, 1885 Newton & Saunders)
- Manual of British Birds*, Howard Saunders (1898)
- Handbook of British Birds*, Harting (1901)
- Boys' *History of Sandwich* (List)
- List of Folkestone Birds* (Henry Ullyett)
- The Zoologist*, 1840–1901
- The Birds of Rainham*, Walter Prentis (1894)
- The author's own notes, 1887–1900
- The author's articles in *The Kentish Express*, August 1899, to June 1900

1. Missel-Thrush. *Turdus viscivorus*, Linn.

Locally, Missel-bird, Screech.

The missel-thrush is well distributed throughout the wooded portions of the county and among our orchards. In the breeding season the number of nests in one locality is sometimes considerable, as many as five or six being found close together. This plentiful distribution invariably occurs after a mild winter, when no severe weather has come to decimate the ranks of our home-bred birds. About the end of July migration commences, the flocks consisting mainly of young birds. Towards the end of Sep-

tember a migration southward may be noticed among many of our home-bred birds, but these partial migrations depend to a great extent upon the supply of food. Should the yews in October yield a good store of berries, numbers of birds will remain in the locality to devour them. During a severe winter large batches of foreigners appear in the county, to leave again however in the following spring. In the severe winter of 1890 a great influx took place, and these foreigners were invariably the first to succumb to the cold weather. Owing probably to severe privations the plumage of these birds was paler in colour than that of our residents.

BIRDS

2. Song-Thrush. *Turdus musicus*, Linn.

Locally, Grey Bird, Snailjobber.

A common resident. During a severe winter or a dry season partial migrations occur to the vicinity of the sea-coast, where the birds feed on mussels and marine insects along the shore. After a time these individuals become dark in plumage.

3. Redwing. *Turdus iliacus*, Linn.

A winter migrant to the county; generally appearing towards the middle of October in small parties, in company with the fieldfare. These are but advance guards of larger forces, which come as the year nears its end; the numbers vary however according to the severity of the winter. When the weather is mild and open very few visit the county. During a severe winter their numbers are large, and they remain with us until the stores of holly berries give out, when the greater number disappear altogether from the county, and we see no more of them until they pass in the spring on their homeward journey, when they have been observed as late as the end of March.

4. Fieldfare. *Turdus pilaris*, Linn.

The remarks on the preceding species apply equally to the fieldfare, which is also a winter migrant to the county, but it stays later than the redwing.

5. Blackbird. *Turdus merula*, Linn.

A common resident, which has increased in numbers of late years, owing to the extension of fruit growing in Kent. Mulberries form a favourite fruit of this bird. In October blackbirds leave our gardens for the most part, and resort to the woods, where they seek their living on ground moistened by fallen leaves and dripping branches. The blackbird is essentially a worm-feeding bird, and there is not a doubt that fallen leaves attract worms more readily to the surface. Partial migrations occur in autumn and winter and again in spring.

6. Ring-Ouzel. *Turdus torquatus*, Linn.

Occurs in Kent as a migrant only. Mr. Walter Prentis says: 'The ring-ouzel passes through Rainham on its passage north in spring, south in autumn; sometimes, when food is to be had, staying a few days with us; always wild, choosing for its perch the tops of trees.' In October, on its journey southward, this bird resorts to furze-covered commons near the sea, and should berries be plentiful it prolongs its stay. It is by no means a common migrant in the county.

7. Wheatear. *Saxicola œnanthe* (Linn.)

Locally, Clod-hopper.

The wheatear arrives in Kent towards the middle of March, and by the time that month draws to an end becomes a familiar figure in our coastland scenery. It is decidedly local as a breeding species in the interior of the county, its distribution varying according to the condition of the spring. Should March be an inclement month, not a few leave the bleak land near the coast and pass further inland for summer quarters. The males appear to precede the females, for on several occasions when noting the arrival of this bird in spring I have seen none but males. In Kent the principal breeding localities of the wheatear are the Lydd beach around Dungeness, Littlestone and in the vicinities of Sandwich and Pegwell Bays and Whitstable, while it nests annually on the low ground between Gravesend and Chatham. The firing-courses at Lydd that now take place annually over this wide tract of beach have apparently failed to banish the wheatear, as they have several other breeding species. In this locality curious unlooked-for spots are often chosen by the birds for their nests. Discarded tins, kettles, and crevices in the gabion casemates are frequently made use of; while in May 1896 the writer discovered a nest inside an empty four-pounder shell. Again, it is not unusual to find the wheatear's nest in a depression on the bare beach. In a case like this dry grass alone is used, the nest resembling a large edition of the lark's, but the normal feather lining is then absent and the nest is thereby rendered less conspicuous. In August a congregating movement may be noticed, and the numbers of birds bred on the south coast are augmented for a short season by migrants from the westward, especially on the Sussex downs, where, in the days of our forefathers, the shepherds carried on a regular trade in these birds, which were looked upon as a great delicacy. We read in Gilbert White's letter to Daines Barrington in December 1773 (Letter xvii.), that 'at the time of wheat harvest, they begin to be taken in great numbers and sent for sale in vast quantities to Bright-helmstone and Tonbridge, and appear at the tables of all the gentry that entertain with any degree of elegance.'

8. Whinchat. *Pratincola rubetra* (Linn.)

A summer migrant to the county, arriving in the second week of April and departing again at the end of August, when parties of young birds in their rufous and black plumage may be observed lingering about waste land,

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on their way to the coast. The appearance of these parties is however irregular. On 30 August 1896 a small flock of six birds (the first since 1893) appeared in a fallow field near Cranbrook. They caught their prey after the manner of flycatchers, being very busy just at dusk in obtaining it, retiring for the night to a neighbouring turnip field. All these birds were young males with their conspicuous white shoulder patches; a fact which I have found to be the case on several former occasions, thereby indicating that the males keep separate from the females on migration. The whinchat breeds locally in the county. Two nests have been sent to me from the neighbourhood of Tunbridge Wells, while in the neighbourhood of Edenbridge the bird is common about the rough railway embankments. Mr. Walter Prentis of Rainham writes: 'A pair frequented a narrow coppice on my farm in 1886. On mowing clover and making hay in the field adjoining, a nest was discovered containing four blue eggs, built on the ground after the manner of the sky-lark's.'

9. Stonechat. *Pratincola rubicola* (Linn.)

Locally, Furze Chat.

Although a resident, this species is more uncommon than the whinchat, since the nature of the county is unsuitable. It is more often observed in winter than summer, usually about our marshland.

10. Redstart. *Ruticilla phoenicurus* (Linn.)

Locally, Fire-tail.

The redstart is sparingly distributed during the summer and breeds in suitable localities, appearing in April and leaving again in September. Like the nightingale it is generally to be found breeding in colonies, and the same locality will often be resorted to year after year. It is however a shy bird, and if persecuted will constantly change its breeding haunts. This accounts for their disappearing from districts where they used to be numerous. It is found in the Rainham (Prentis) and Stourmouth districts (Dowker). Wherever there are fir woods it is generally to be found. Near Cranbrook it breeds annually in the Bedgebury woods, where in May 1896 I observed no fewer than five pairs in a single morning, and found several nests, two of which were on ledges of sandstone in an old disused pit: nesting sites the redstart appears to be particularly fond of. In the same month, on 12 May, I discovered another nest in a very curious situation. It was placed inside a disused pheasant's coop, and side by side was another

nest belonging to a marsh-tit. On my approach the owners flew away, showing eggs in both nests.

11. Black Redstart. *Ruticilla titys* (Scopoli)

A scarce winter visitor to Kent. I have observed individuals on the hills about Dover and Folkestone. No authenticated instance of the bird breeding in England has yet been recorded. Mr. Oxenden Hammond observed an old male bird near Wingham on 9 May 1883, which looks suspiciously as if a pair were breeding in the locality, yet the nest was not discovered. This redstart is by no means common in the county, although it is said to be increasing in other counties. A reason for this may be looked for in the fact that this species generally affects high ground near the sea on its arrival. The only high coast that Kent can show is in the vicinity of Folkestone, Dover and St. Margaret's Bay, and there specimens of the black redstart have occasionally been obtained.

12. Red-spotted Bluethroat. *Cyanecula suecica* (Linn.)

A very rare visitor in spring and autumn. Kent lies too far south for us to receive many stragglers of this species.¹ To my knowledge three specimens have been obtained in Kent. One in Sheppey in 1844 (George Dowker). On 16 May 1845 a fine old male bird was taken in a nightingale trap and was kept alive for several months, and during that time examined by the well known ornithologist, the late Mr. John Hancock. The third instance occurred in September 1881, when a specimen was obtained in the marshes near Dartford. Mr. Grey, the curator of the Dover Museum, writes as follows: 'I once saw a beautiful specimen of the bluethroat in the meadow behind the Castle and followed it for some time. It kept flying from a hedge to a turnip field, but only having a butterfly-net with me I stood no chance of getting it.'

13. Redbreast. *Erithacus rubecula* (Linn.)

A common resident. In September a migration southward may be observed. When

¹ During the autumn migration individuals are obtained almost annually on the Norfolk coast between Wells and Cromer (*V.C.H. Norfolk*, i. 228). This portion of the English coast might be described as a halting or resting place in the movement of migration of those birds that breed in northern Europe, for a northerly wind sends these migrants to this prominent piece of coast-line, whence after a short stay they cross the sea on their way southward.

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winter approaches many of the robins, especially the birds of the year, retire to our thick fir woods, where they roost in the warm beds of pine-needles, or in holes scratched by rabbits and other rodents.

14. Nightingale. *Daulias luscinia* (Linn.)

In the third week of April the nightingale appears in the county (the male birds arriving first) to take up their summer quarters in our copses. This species has increased very much within the last three years, and pairs may even be found nesting within the confines of our gardens. A good idea of its distribution in the county may be arrived at by following the course of the valleys, for the nightingale invariably selects the low wood-covered ground, where streams may be found, in preference to any other; and in such places colonies may be met with, the birds returning yearly to the same spots. A remarkable instance of devotion towards their offspring occurred near Cranbrook in 1897. A pair chose as a nesting site a bank directly behind the rifle range, where practice was carried on twice a week. The nest was placed in a hole made by former bullets and in a line with the central target. Two days after the young appeared the male bird was killed, but his mate continued to feed her five young ones amid the spattering of bullets. The young eventually left the nest and gained a bunch of faggots just above it, and whilst here one of the little band was killed. After this the mother led them to a safer retreat, out of range.

15. Whitethroat. *Sylvia cinerea* (Bechstein) *Locally, Nettle-creeper.*

Between 13 and 20 April the common whitethroat may be looked for, but the date of its arrival varies a good deal with the condition of the weather, for should the spring be wet and inclement the bird will not be seen much before the latter date. This summer migrant is numerous throughout the county.

16. Lesser Whitethroat. *Sylvia curruca* (Linn.)

The lesser whitethroat arrives about the same time as its close congener, but it is rather a scarce bird and of local distribution, keeping much to the tops of trees, especially oaks. A marked increase in the numbers of this warbler took place in many localities in the summer of 1896, when both this and the previous season were remarkable for the great plagues of the green oak-moth (*Tortrix viridana*), whose caterpillars stripped and drilled to a deplorable extent many of our oaks.

On these the young of the lesser whitethroat are principally fed.

17. Blackcap. *Sylvia atricapilla* (Linn.)

Common in the well wooded districts from the middle of April onward, but its distribution varies yearly. Its appearance in Kent has been recorded in the end of March.

18. Garden-Warbler. *Sylvia hortensis* (Bechstein)

Not so common as the preceding species, and I have noticed that in localities where the one species abounds the other is absent. In the summer of 1896, when our oaks suffered severely from caterpillars, the garden-warbler, which had been scarce in the neighbourhood of Cranbrook, became numerous, while at the same time the blackcap warbler almost disappeared.

19. Dartford Warbler. *Sylvia undata* (Boddaert).

This warbler is named after the town near which it was first recognized as an English species by Dr. Latham, who obtained a pair on Bexley Heath near Dartford on 10 April 1773. It is a scarce resident and chiefly confined to the western portion of the county, where there are heath and furze commons. It has been obtained at Guston near Dover (16 March 1887), at Woolwich (*Zoologist*, 1863, p. 8819) and at Rainham (Prentis).

20. Goldcrest. *Regulus cristatus*, K. L. Koch.

Found throughout the county. Of late years it has become numerous owing to the increase of larch and fir plantations, where it is generally to be found in small parties throughout the winter, returning in the spring to our gardens as soon as the deodars begin to put forth their shoots, beneath whose tray-like branches it suspends its beautiful little nest. About the middle of November, when stormy weather with south-westerly winds is generally experienced, numbers arrive on the coast from the continent and leave again in April. These birds possess a roving disposition and continually shift from one locality to another, never being in one place for any length of time. Mr. Walter Prentis of Rainham, writing in 1894, says: 'I have not seen the golden-crested wren for several years; what has become of them I do not know, unless they have been affected by the cold and wet summers.'

21. Firecrest. *Regulus ignicapillus* (C. L. Brehm).

This wren is a rare visitor to the county.

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The specimens on record have all been obtained in the winter and after stormy weather. The first individual, a female, was shot in an apple tree in December 1860 at Rainham, by Mr. Walter Prentis. Another specimen was obtained at Whitfield near Dover in 1884; while the last two records are from the neighbourhood of Lydd. On 10 October 1896, after several days of stormy weather with strong south-easterly winds, a male bird was shot by Mr. Brann of Broomhill farm near Rye, in an apple tree outside his house. The bird was in company with several of the common species. It was sent to me for identification and preserved by Mr. Springett of Cranbrook. The second specimen, another male, was shot in the same tree in 1897, and curiously enough on the same date, 10 October. Both of the specimens are now in my collection.

22. Chiffchaff. *Phylloscopus rufus* (Bechstein)
Locally Oven-builder.

A common spring migrant. My diary for several years records its appearance between 24 and 28 March, when its well known note has been very hoarse and hardly audible.

23. Willow-Warbler. *Phylloscopus trochilus* (Linn.)
Locally, Yellow Wren.

A common summer migrant coming in the first week of April, and from that period onward this bird arrives in parties at well marked intervals, a wood that was silent before becoming suddenly filled with their voices. As soon as the buds of the apple trees show signs of bursting, the bird is often to be heard in orchards, where it seeks after and feeds upon the destructive apple aphid (*Aphis mali*). The food of this little warbler consists to a great extent of these injurious insects, and for this reason gardeners should encourage the bird in their gardens, where, in August especially, it may be noticed attacking the broods of aphid on the rose bushes. I have found the willow-warbler nesting in colonies, discovering as many as five nests in one copse. From the shape of their nests both the willow-warbler and chiffchaff are locally known as 'oven birds.'

24. Wood-Warbler. *Phylloscopus sibilatrix* (Bechstein)
Locally, Yellow Willow-Wren.

The wood-warbler is of local distribution in the county and arrives about the middle of April. In some districts however it is the most numerous of the three yellow warblers.

I first observed this species in the Cranbrook district in the summer of 1896. A few pairs now come annually to certain spots in the Angleley and Bedgebury woods, in which are to be found tall firs and beeches, trees of which the wood-warbler seems very fond. At Eastwell near Ashford the wood-warbler is locally distributed, while it does not appear to be found in the Canterbury district (Oxenden Hammond). In the woods about Dover it breeds sparingly (Gray). In the Chatham and Sittingbourne districts the bird is only seen on passage in spring and autumn.

25. Icterine Warbler. *Hypolais icterina* (Vieillot)

The rare icterine warbler has occurred once in Kent; the first example obtained in England is now in the Dover Museum, having been killed at Eythorne on 15 June 1848 by the late Charles Gordon. This warbler is common on the continent, and it is quite likely that it occurs more often in England than is supposed, since, owing to the thick foliage, it probably escapes detection, while to an ordinary observer the bird would pass as a wood-warbler. However, its stouter build, yellower under-parts and the lack of yellowish-green on the upper parts, serve principally to distinguish it from the latter species.

26. Reed-Warbler. *Acrocephalus streperus* (Vieillot)

This warbler arrives in Kent in the latter part of April and is still plentiful in suitable localities, especially in the Wingham and Romney marshland and in the vicinity of the river Rother, but there is not a doubt that its numbers have of late years decreased, owing to the drainage of our reed beds and marshy places. Further, this drainage and the prolonged droughts of the last three seasons have afforded to the farmers an easier access to these reed beds, which they now systematically cut over, using the reeds as thatching material for their stacks.

[No identified example of the marsh-warbler (*Acrocephalus palustris*, Bechstein) is known to have occurred in the county, but the species may easily have been overlooked, owing to its similarity to the reed-warbler, from which it chiefly differs in having the upper parts washed with a distinct greenish olive-brown instead of rufous. Especially is this noticeable in the feathers of the rump. I have carefully examined a reputed specimen of this bird in the fine collection of Mr. Walter Prentis and mentioned by him

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in his *Birds of Rainham* (p. 25), but it is a reed-warbler and fails to correspond with typical examples of *A. palustris* with which I have compared the example.]

27. Great Reed-Warbler. *Acrocephalus turdoides* (Meyer)

This bird is an extremely rare visitor; only two specimens have been obtained in Kent. On 4 May 1853 an individual was shot by the side of a pond near Sittingbourne by Mr. G. Thomas of that place. The other was obtained in the Wingham marshes on 14 September 1881, by Mr. Oxenden Hammond, who writes of the occurrence as follows: 'While snipe shooting, on September 14th, I came across a warbler of some kind, which I failed to identify satisfactorily. I had marked a snipe down, as I believed, in a water-cress covered stream, which flowed between an alder bed on one bank and a bank of very high reeds on the other. I had not gone far up the windings of this channel, when the bird in question rose out of the coarse herbage and instantly entered the reed-bed opposite. I was struck by its appearance and sent my retriever into the reeds. The bird moved through the reeds at once before the dog, and my keeper seeing it, forced it out by a thrust or two of my marsh-jumping pole. It flew along the watercourse very low, just topping the cresses with a weak fluttering flight, and some dust shot then struck it down. I found no difficulty in identifying the bird as the great reed warbler.'

28. Sedge-Warbler. *Acrocephalus phragmitis* (Bechstein)

In Kent the sedge-warbler arrives at the end of April and frequents ditches which are overrun with brambles and places where there is rough herbage. The vicinity of water is not essential to this bird, the nest being often found on the ground in thick grass by the roadside. During the migration in September small parties may be seen in the dykes of our marsh-land near the sea.

29. Aquatic Warbler. *Acrocephalus aquaticus* (J. F. Gmelin)

Has occurred once in the county, an example being obtained near Dover by the late Mr. C. Gordon. The specimen remained in Dr. Plomley's collection in the museum of that town for some time unidentified till February 1871, when Mr. J. H. Gurney found it to be a genuine example of this rare warbler. In Borrer's *Birds of Sussex* there is a fine coloured plate of the aquatic warbler by Mr. Keulemans.

30. Grasshopper-Warbler. *Locustella naevia* (Boddaert)

This warbler, locally known as 'cricket-bird,' comes to us near the end of April, taking up its abode in thickets, close as a rule to running water where there is plenty of 'bottom' in the form of coarse grass. It is by no means common and of very local distribution. Its retiring and skulking habits make observation difficult, the bird being more often heard than seen, its peculiar scissor-grinding song breaking the silence of evening. According to Mr. Walter Prentis this bird, formerly plentiful, has disappeared from the Rainham district. In his collection there is a peculiar variety obtained on 5 June 1869; back greenish-brown with darker markings, breast greenish-yellow without spots. In the Cranbrook neighbourhood a few pairs breed annually in the woods around Sissinghurst. It is found near Maidstone, a nest and two eggs with the female bird being in the museum of that town, and taken near Hollingbourne in May 1882. Nests have also been found near Ashford, while in the Stourmouth district the bird is scarce (Dowker). About Dover it breeds sparingly (Gray), and it has also been observed at Pembury near Tunbridge Wells (*Zool.* 1857, p. 5685).

31. Hedge-Sparrow. *Accentor modularis* (Linn.)

A well distributed resident in the county, its numbers remaining constant throughout the year. Although one of the earliest of British breeding birds it is often among the latest. In the Cranbrook neighbourhood a brood was still in the nest on 23 August 1890.

32. Dipper. *Cinclus aquaticus*, Bechstein.

The dipper or water-ouzel is a rare bird in Kent, where only a few individuals on migration have been obtained. The county is unsuitable to the habits of this species, as shallow rivers studded with stones and running streams are not to be found in Kent, so the dipper as a resident is absent. I have the following records: Two in the Dover Museum, one being in the Plomley collection, and therefore probably obtained in the neighbourhood of Lydd; the other shot on the river at Dover in 1870 (Charles Gordon). One in the local collection of the Maidstone Museum (G. Simmons). Lastly, in December 1890, a dipper was shot on the rocks at Margate (J. H. Gurney, *Zool.* 1891, p. 274). To these records I shall also place the observation of one near Cranbrook. The dipper is such a remarkable looking bird that it can hardly be mistaken for any other. On

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4 November 1894, Mr. Thomas Weston of Standen House, Benenden, observed a bird which flew close to him. It was shot at, but not obtained. A few days afterwards he identified the bird as the same as some dippers, obtained in Scotland, in Mr. Springett's shop in Cranbrook. The country below Benenden is not at all an unlikely locality for one of these birds, since there are several running streams that find their way into the Rother.

33. Bearded Tit or Reedling. *Panurus biarmicus* (Linn.)

Many years ago the bearded tit or reed-pheasant ceased to exist in Kent, and there is now no likelihood of its ever returning owing to the drainage of our marshes and reedy places, while the constant cutting over of the reeds affords these shy birds no asylums for their nests. Formerly it was a resident. In the second edition of his *British Ornithology*, published in 1821, Graves writes: 'The bearded titmouse is found in considerable abundance in the extensive tracts of reedland from Woolwich to Erith in Kent'; while in the days of Dr. Plomley of Lydd (about 1840), whose collection of Kent birds is now in the Dover Museum, 'the reed-pheasant was occasionally found in Romney Marsh' (Bartlett, *Zool.* 1884, p. 621). Mr. George Dowker, writing in 1889, says, 'the Rev. B. Austin shot one in the Monkton Marshes some years ago.' In 1865 three specimens, one male and two females, were shot at Burham near Maidstone (Prentis). Before that time it probably ceased to breed in the county. In my collection I have a pair obtained from Romney Marsh in 1844, and by the worn condition of the female's plumage these birds had evidently bred that year in the marsh.

34. Long-tailed Tit. *Acredula caudata* (Linn.) *Locally*, Bottle Tit, Muffle Tit.

A common resident. From October onwards small parties of these birds may frequently be observed threading their way through our larch plantations and copses. By the time March has come these parties have paired off and then resort much to orchards, where they often select the lichened boughs of the apple trees for their nests. An example of the typical *A. caudata*, distinguished from our British bird by the entire head being white, was obtained near Dover Castle by Mr. Gordon and is now in the collection of Mr. Walter Prentis of Rainham, where I have seen it.

35. Great Tit. *Parus major*, Linn.

The great tit, locally known as 'ox-eye,' is very common throughout the county. It begins to utter its shrill staccato note, like the whetting of a saw, very early in the year, if the weather is mild, becoming very persistent in March. Curious nesting sites are frequently chosen by this tit. On more than one occasion in the Cranbrook neighbourhood I have found the nest built in an old squirrel's drey; but holes in fruit trees are for the most part chosen, the birds often returning to the same nesting site in several successive seasons till the nesting material collected together assumes great proportions. A nest taken at Bedgebury in 1896, built in a disused pheasant's coop, was of remarkable dimensions shaped like a square block of well-felted moss.

36. Coal-Tit. *Parus ater*, Linn.

Locally, Blackcap.

Locally distributed. Where the marsh-tit is present this species is generally absent. This I think is due to the pugnacity and quarrelsome nature of the marsh-tit. The coal-tit is a retiring bird and keeps much to our fir plantations, especially during the breeding season, while the marsh-tit may often be found nesting in our gardens.

37. Marsh-Tit. *Parus palustris*, Linn.

A common resident. The nesting site of this species varies according to the nature of the locality. About Cranbrook holes in pollard willows close to running water and in other decayed trees (often bored by the bird itself) are generally selected. In the Rainham district low stubbs in the woods are taken for nesting sites (Prentis). Both this and the preceding species very often nest in holes in the ground.

This bird has been known to conceal her eggs before commencing incubation should her nest be in the vicinity of any disturbing influence. In May 1896, in a garden near Cranbrook, this tit built its nest in an old decayed laburnum, close to a spot where rubbish was continually being deposited. The nest, when I found it, contained two eggs which were carefully covered over and concealed with a thin layer of hair and wool, felted together. The next morning the three eggs were similarly treated. After the full complement were laid incubation commenced and the young eventually hatched.

This tit is also, like the coal-tit, locally called 'blackcap.'

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38. Blue Tit. *Parus cæruleus*, Linn.

Locally, Tom-tit.

A well distributed resident. It is observed either singly or in pairs throughout the year, haunting the woods and copses in winter and our gardens and orchards in early spring, when it does much good in destroying the eggs of the destructive coccus insect, which infests the bark of apple and pear trees.

39. Nuthatch. *Sitta cæsia*, Wolf.

Locally, Nutjobber, Woodpecker.

In the wooded districts this bird is common, but in some localities its distribution does not always remain constant.

Near Cranbrook in 1896 the nuthatch bred very sparingly as compared with former years ; while on the other hand a wonderful increase took place in its numbers in the Tunbridge Wells district. Although the nuthatch is partial to woods as feeding grounds, well-timbered grass land proves a still greater attraction, the turf being carefully hunted for small worms. In Kent holes in apple trees and oaks are for the most part chosen as nesting sites, especially those in the former trees. A favourite hole is often resorted to annually. A remarkable instance of the building economy of this species came under my notice in the spring of 1898. On 25 April a pair commenced building in a hole of an old apple tree. The first thing the birds did was to build up a store of clay and mud in the fork of a branch adjoining the nest-hole. Within a couple of days this lump of clay reached a height of six inches and two in thickness. This material was mixed with horsehair and portions of skeleton leaves. All this work was accomplished by the female bird, the male accompanying her on her journeys. The female next directed her attention to the nest-hole itself, filling the bottom with bits of straw and dead grass-stalks. When this was done she commenced to line both sides of the entrance with clay. After this she would gain the entrance, face about and begin to chisel away the rough ends of the clay lining till the surface became smooth. As the building went on the natural aperture of the hole was soon reduced in size, till at length the bird, on issuing from it, had literally to wriggle her body to and fro to get out. She looked a queer little object on leaving the hole, her back and wings coated with mud. A pair of starlings then attacked the nest and destroyed a great deal of the clay lining. The nuthatches however were not to be beaten. To meet this emergency they at once commenced to draw upon their

store of clay on the neighbouring branch. Breaking off a piece of the hard material the female bird would disappear into the nest-hole, the next minute to appear at the entrance with the clay made soft and ready for use by means of her saliva. In this way the nest-hole was soon rebuilt.

During the breeding season—about the middle of April—the clear musical whistle of this bird becomes tremulant and might then be described as a series of bubbling notes. The winter call-note is 'tewit,' rapidly uttered and repeated several times in succession. This cry, merely prolonged and slurred upwards, becomes the spring call-note just mentioned. Towards the end of May, when the young are abroad, this bird becomes silent and is seldom heard again till September, when the winter call-note is resumed.

40. Wren. *Troglodytes parvulus*, K. L. Koch.

A well known resident. In October the numbers of our resident birds are increased by migrants which appear on the south coast, generally after strong south-westerly gales have been experienced, when I have noticed numbers hiding in the sheltered dykes and weather-beaten trees and bushes in the marsh land between Rye and Dungeness.

41. Tree-Creeper. *Certhia familiaris*, Linn.

Locally, Tree-crawler.

A resident sparingly distributed in the county, but more numerous in the well-timbered and wooded districts.

42. Pied Wagtail. *Motacilla lugubris*, Temminck.

A well distributed resident, more numerous at certain seasons than at others. Many of the old birds stay with us throughout the winter. In the early autumn the young of the year begin to move southward, and at that time these are often seen in numbers on our lawns during the heat of an August day busy catching the flying ants. At the end of September they congregate prior to crossing the Channel near the sea-dykes between Rye and Dungeness, and gradually edge their way to the latter place, where the passage is shortest.

In spring, about the middle of March, adult birds appear along our coast-line, the males as a rule being the first-comers. Albinistic specimens are now and again met with. There is one in the Dover Museum. This wagtail is locally named 'dishwasher.'

43. White Wagtail. *Motacilla alba*, Linn.

An irregular summer migrant. There are

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two specimens in the Dover Museum from Lydd, where this species has nested (Plomley).

44. Grey Wagtail. *Motacilla melanope*, Pallas.

A summer and winter visitant, but very locally distributed. It keeps much to the vicinity of running water, and is seldom found like the pied wagtail on fallow or grass land. In September immature birds visit our brooks and streams on their migration southward, often remaining for several days in the locality, while during winter an occasional adult bird has come under my notice. It breeds very sparingly in the county. I have records of nests taken near Cranbrook and in the vicinity of Dover, not far from the river. It does not appear to breed in the Rainham district, but is now and again met with during winter in the marsh land (Prentis).

45. Blue-headed Yellow Wagtail. *Motacilla flava*, Linn.

An occasional summer visitor. An individual was killed by striking itself against the telegraph wires between Deal and Dover on 1 May 1889. Mr. Oxenden Hammond identified the bird soon after it was picked up.

46. Yellow Wagtail. *Motacilla raii* (Bonaparte)

A summer visitor to the county, the influx in some years being considerable. Many breed in the dyke land between Rye and Dungeness, where I have frequently found nests. A few individuals pass further inland and frequent plough land and pea fields, where they breed. I have seen them near Ashford, frequenting bean fields, to which they seem very partial. Towards the end of August they begin to congregate prior to departure, and may sometimes be seen in considerable numbers on the south coast. The young are the first to depart, the old birds going somewhat later, some of which remain with us till quite late in autumn. In 1894 a bird was observed at Cranbrook on 19 October. The following note is from my diary during the migration season near Rye in 1896: 'On August 27th, during the evening, an extraordinary influx of yellow wagtails took place. The bean and stubble fields became literally alive with them, while many perched after the manner of swallows on the telegraph wires near the sea-wall. Just now the males of this species are very quarrelsome and may constantly be seen fighting amongst themselves.' This wagtail arrives in the county with considerable regularity. In 1895 it appeared

at Cranbrook on 2 April, and in the following year on 26 March. Mr. Prentis of Rainham says: 'The yellow wagtail comes on or about April 10th, sooner or later according to the weather: they breed as a rule in our pea-fields, not often in the clover.' On 10 April 1895 Mr. Springett of Cranbrook received a beautifully coloured specimen obtained in the neighbourhood. The whole of the underparts were a rich sulphur-yellow. Examples of this kind not unfrequently occur. Mr. Prentis says: 'the first-comers on the spring migration are always the most brilliant in plumage.'

47. Tree-Pipit. *Anthus trivialis* (Linn.)

A well distributed summer visitor, arriving during the first week in April and leaving again in September. It frequents copses and woods (especially those of the latter that have been cut over) in the vicinity of moist low-lying ground. Mr. Prentis says: 'In the Rainham district, when making hay near the woods, the tree-pipit flies from heap to heap, keeping the hay-makers company, singing all the while its pleasing song.' This bird arrives in the county with surprising regularity. In the Cranbrook district in 1894, 1895 and 1896 the dates of arrival were 7, 4 and 2 April respectively.

48. Meadow-Pipit. *Anthus pratensis* (Linn.)

A resident in the county throughout the year, but the majority, consisting chiefly of young birds, leave in September, when I have observed considerable parties feeding on grass seeds among the sand dunes in the vicinity of the south coast, prior to their departure across the Channel. In March a return migration takes place, small parties after leaving the coast line coming to our meadows, where they disperse and pair off for the breeding season.

49. Red-throated Pipit. *Anthus cervinus* (Pallas)

An example of this rare species was shot by Mr. Prentis at Rainham in April 1880 (*Birds of Rainham*, p. 32). It was identified by Dr. R. B. Sharpe.

50. Richard's Pipit. *Anthus richardi*, Vieillot.

This rare pipit has been obtained twice in the county, while on another occasion in the year 1890 it was observed at Rainham by Mr. Prentis. The late Mr. Charles Gordon of the Dover Museum, writing in October 1868, says: 'On the 21st of October, I shot a most superb specimen of Richard's Pipit in a cornfield in the environs of Dover. It

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attracted my attention by its loud call. The specimen is in good condition having completed its moult. It is a male.' This specimen is now in the Dover Museum. In 1890, about the middle of November, a second specimen was caught by a bird-catcher near Dover and is now in the collection of Mr. Oxenden Hammond.

51. Rock-Pipit. *Anthus obscurus* (Latham)

An uncommon visitor in spring and autumn. On the south coast between Rye and Dungeness, individuals, all adults, may be noticed at the beginning of October. In the Rainham district, Mr. Prentis says: 'It is common in winter along the shores of our creeks, it does not occur in summer time.' In the same paragraph Mr. Prentis records an observation of the Scandinavian form of the rock-pipit (*A. rupestris*): 'On a rough day in March, the wind blowing for several days from the east, the marsh was full of rock pipits. I observed a strange looking variety with a reddish-brown breast, its note on being disturbed was very different from that of the rock pipits.' Booth says: 'The rock pipit used to arrive in Sussex in considerable numbers from March to April, though it never remained to breed.'

52. Golden Oriole. *Oriolus galbula*, Linn.

A summer migrant. There is not a doubt that this beautiful bird would become an annual breeder in the county provided it was protected from molestation, but unfortunately its bright plumage catches the eye of the greedy gunner, into whose hands, nine cases out of ten, it falls an easy victim. This bird has nested on four occasions in the county. In June 1836 a pair reared their young in an ash plantation near Ord. The young were taken every care of, but did not long survive their captivity. In May 1849 a nest with three eggs, together with the parent birds, were taken near Elmstone. The nest was suspended from the extreme end of a top branch of an oak tree and composed entirely of wool, carefully bound together with dried grass. Both the old birds and the nest are in the Dover Museum. In 1851 another nest and eggs were taken at West Mill near Wingham, Kent (Harting, *Handbook Brit. Birds*, 1901, p. 36). In June 1874 another pair nested in Dumpton Park, Isle of Thanet, and owing to the protection afforded them by Mr. Bankes Tomlin they reared their young in safety. Mr. Harting saw the nest, and gives an interesting description of it in his *Summer Migrants*, p. 268.

The following further specimens have been recorded from the county: One, June 1850, near Elmstone (*Zool.* 1850, p. 2851); one, 14 June, 1853, Eltham (*Zool.* 1853, p. 4014); one (female), autumn 1868, Faversham (*Zool.* 1869); one (female), June 1869, Southfield Park, Tunbridge Wells. In the collection of Mr. Hammond there is a pair, obtained near Wingham. Of late years my records are: Adult male, adult female, 1883, near Dover (Prentis collection); adult male, May 1893, Sissinghurst (*Zool.* 1896, p. 346); adult female, 15 May 1896, High Halden (*Zool.* 1896, p. 346); another seen June 1896, Sissinghurst (*Zool.* 1896, p. 346).

From these records it will be readily seen that there would be little or no difficulty in inducing the golden oriole to become a regular summer resident, provided it were carefully protected from persecution. These orioles come over in pairs with full intention of nesting. The males are the ones that are generally shot, while the females, owing to their less brilliant plumage, escape observation more easily. However, at the present time the bird can only be regarded as a visitor that comes to our shores in danger of its life.

53. Great Grey Shrike. *Lanius excubitor*, Linn.

An irregular autumn and winter visitor, generally met with outside the wooded districts. There is no record of its ever having bred in the county, although I have obtained specimens from the neighbourhood of Eastwell as late as March. In the Cranbrook district it has been observed by Mr. Springett, who told me that on one occasion, while out rabbiting, he saw a band of tits all collected together in the thick undergrowth, and one and all making a great uproar. They were being driven forward by a great grey shrike, who was endeavouring to force them to debouch into an open field hard by. The little birds got so confused after a time that many left their thick retreat, and consequently one of their number fell a victim.

54. Lesser Grey Shrike. *Lanius minor*, J. F. Gmelin.

A rare visitor in spring and autumn. An individual was observed on 15 May 1897, in mid Kent by Mr. F. W. Frohawk (*Zool.* 1897, p. 427).

55. Red-backed Shrike. *Lanius collurio*, Linn. *Locally*, Butcher Bird.

A local summer migrant, arriving in the county at the end of April. More plentiful in the wooded portions, in which it has

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increased during the last few years. Thick copses in the vicinity of woods are favourite resorts, where it is not unusual to find several nests in close proximity to one another. A 'tiller' or some other small tree is chosen as a look-out post, and this is resorted to some time before building is commenced. Incubation is performed by the female, who leaves the nest and flies to the 'tiller,' and is there fed by the male. When the young are about a week old the parents display great activity in searching after food. Should the male come to the nest and find his mate feeding the young ones he straightway impales the prey upon the thorns around the nest and is off again into the thicket. In the less enclosed portions of the county the nest is generally built in thick thorn bushes on the borders of pastures or in roadside hedges. In August the red-backed shrikes with their families may be observed basking on the sunny side of palings that border plantations. By the end of the month these parties have left us.

56. Woodchat Shrike. *Lanius pomeranus*, Sparrman.

A very rare summer visitant. It has been obtained four times in the county: one near Faversham, July 1868 (*Zool.* 1869, p. 1863); two near Rainham, one on 7 May 1868, in the collection of Mr. Walter Prentis; one caught by bird-catchers in the warren between Dover and Folkestone and identified by Mr. Hammond, in whose collection it may be seen.

57. Waxwing. *Ampelis garrulus*, Linn.

A rare winter visitor, by no means regular, many years elapsing between the visits; the occurrences being generally marked by a severe winter. It appears in small parties and is sometimes found in company with starlings. In the autumn of 1840 a specimen was obtained at Kingston near Canterbury (Pemberton Barlett). In January 1848 eight were killed at Deal. In 1850 a remarkable visitation took place. Several were obtained in January of that year near Maidstone, from Eltham and Rainham, and from Brenchley near Tunbridge Wells. In December 1867 eight specimens were procured in the Plumstead marshes near Woolwich, and three in the woods about Faversham; and according to Mr. Prentis of Rainham, 'one was shot from a pair in our woods in 1867, another obtained in an orchard, while a small flock was seen in an orchard near Milton.'

The last recorded visitation took place in January 1893, when a female was shot at

Smarden, and on 24 January a male at Marden. Both specimens I examined in the flesh; they were shot when in company with starlings, and were feeding at the time on the haws in a hedgerow. The winter was a severe one.

58. Pied Flycatcher. *Muscicapa atricapilla*, Linn.

A scarce spring and autumn migrant. There is no evidence of its breeding in Kent. In the autumn of 1894 I obtained near Cranbrook a female, evidently on migration. It was at the top of a tall oak tree and in company with some willow-warblers.

In the collection of Mr. Prentis there is an adult male, obtained at Rainham in 1881.

59. Spotted Flycatcher. *Muscicapa grisola*, Linn.

A well distributed summer visitant, arriving in the county during the first week in May. It is wonderfully punctual in its appearance every summer, and for three consecutive years I have recorded its arrival within a day of each other. It leaves in the middle of September.

60. Swallow. *Hirundo rustica*, Linn.

A well known summer migrant, but not so plentiful during the last few years. The migration movement southward in autumn may be well noticed on the south coast between Rye and Dungeness. Throughout September large batches of swallows on migration break their journey along this portion of the coast. Flock after flock comes and goes, always edging to the eastward—to Dungeness, where the crossing is effected.

61. House-Martin. *Cheledon urbana* (Linn.)

A common summer migrant. In many localities it nests in considerable numbers, but in others it has disappeared, owing to the persecution it receives from the house-sparrow, which appropriates and takes possession of its nest.

62. Sand-Martin. *Cotile riparia* (Linn.)

A summer migrant of local distribution. It nests in many of our railway cuttings and sand pits. Throughout the Weald it is by no means common. It breeds near Cranbrook, where I have taken the eggs; near Dover; and there is a large colony close to the station at Chislehurst. The breeding distribution of this species in Kent may be roughly taken as running along the chalk range from Dover to the neighbourhood of Sevenoaks.

Regarding the migration of this species, as

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well as of the two former ones, the following notes from my diary, taken on the Lydd coast in the autumn of 1896, may be of interest :—

September 4th, 1896.—On my way to Rye. Large numbers of swallows flying to and fro over the hops. The hop fly is very abundant this year. These birds were busy catching them as they left the hops.

Sept. 6th, near Lydd.—Young swallows and martins are in great strength, skimming to and fro over brackish pieces of water, or basking on the sands at low tide. Towards evening these large bands had moved eastward along the coast and were within two miles of Dungeness Point.

Sept. 11th.—Stormy, south-westerly wind. Numbers of young swallows and with them a few sand martins.

Sept. 12th.—Cloudy, south-westerly winds. Large numbers of sand martins, both old and young.

Sept. 15th.—Strong south-westerly wind. The majority of swallows and sand martins have left.

Sept. 25th.—Very rainy ; a strong south-westerly gale.

Sept. 26th.—Squally. A further influx of young swallows and sand martins has taken place. The swallows seemed tired, many squatted motionless on the grass, now and again hovering over it after the manner of kestrels. The sand martins were by far the most active. Their flight appeared steady and strong.

Sept. 28th.—A large number of swallows, probably the last batch of migrants. They hovered to and fro over a row of corn stacks, catching the flies and insects that were attracted by the straw.

3 p.m.—The flocks of swallows round the stacks have suddenly disappeared. Towards evening heavy rain came on with a strong south-westerly gale. It looks as if these birds had foreseen the coming storm and had taken advantage of the comparatively fine afternoon to cross the channel in safety.

October 4th.—A few swallows and house martins about ; they are in very poor condition. The mortality in these late passages must be great.

Oct. 12th.—The main body of the late broods of house martins appeared on the coast this morning. They attached themselves in parties to cottages and farm buildings, in front of which they hovered and circled in a sluggish manner. Several were found perished on the window sills, while not a few lacked tail feathers, looking in this state, as they flitted to and fro, more like little bats than anything else—a routed army flying in full retreat. It would not have been difficult to knock many over with a stick, so weary did they seem, barely possessing enough strength to fly up to the eaves, where they clung to peer and search in vain for tiny mud-beaded houses, like those they had left only a few weeks back.

63. Greenfinch. *Ligurinus chloris* (Linn.)

A common resident. In autumn and winter these birds resort to the stubble fields

with chaffinches and sparrows. In September the greenfinch does considerable damage to the hops. During severe weather they leave the fields for the vicinity of farm buildings.

In the collection of Mr. Prentis there is a wild hybrid between this species and the linnet. This occurrence is extremely rare.

64. Hawfinch. *Coccothraustes vulgaris*, Pallas. *Locally, Grosbeak.*

Previous to 1895 this bird was not common. Now it is steadily increasing in the wooded districts, nesting annually in our woods. I have frequently found in one small wood several nests within a short distance of one another. It is only since we have experienced the caterpillar plagues of the oak-moth that this bird has become numerous in the Weald.

Partial migration of the hawfinch occurs in the winter, the bird returning to our woods in the spring. In Kent it nests in the woods, and in our orchards and pleasure grounds. In the woods the hawfinch generally chooses an overhanging bough of a large oak or the fork of a 'tiller' for its nest, whose height from the ground varies from 12 feet to 15 feet. Sometimes fresh leaves are intertwined with the nest as additional concealment, and this is invariably the case when it is built on a tree-limb which has leaf-shoots. Considerable discretion is shown in the choice of a nesting site, the oaks that are the most forward being selected, so that by the time building is completed the oak may be out in full leaf, when the other trees are merely toned with the filmy green of bursting buds.

Although this species is shy in character, it prefers to nest in the proximity of dwellings ; for instance, near a keeper's cottage or in a tree that borders a much-frequented ride in a wood. The number of males appear to predominate over the females. Very often in the breeding season the female will have a follower in the shape of another male. Should anything threaten the nest both males appear on the scene and share in the common danger ; and if by chance the female's mate is destroyed, the second male takes his place and performs all his duties. In March a considerable influx of these birds occurs. Numbers of pairs arrive in gardens and enclosures where beech trees grow, and these favoured localities are resorted to yearly. In these places they stay till about the middle of April, when they betake themselves to neighbouring woods and copses to breed. The early morning is the time to observe these birds. They go stringing over the tree-tops in single and double file in order to recon-

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noitre every corner of the wood with an eye to choosing a nest site, the whole time uttering their metallic call-notes.

65. Goldfinch. *Carduelis elegans*, Stephens.

A resident, but of local distribution. A few years ago it was decreasing rapidly, but now, owing to the Wild Birds Protection Act and the increase of plantations, which foster the growth of thistles, this charming little bird has once more rallied and is again numerous in the favoured localities. From October onwards small flocks may constantly be observed where there is thistle-growth and rough herbage.

66. Siskin. *Carduelis spinus* (Linn.)

A winter visitor, coming to us in small flocks wherever there is alder and hornbeam, of the seeds of which this bird is very fond. It generally appears in November in company with the lesser redpoll, but its appearance is irregular.

67. House-Sparrow. *Passer domesticus* (Linn.)

An abundant resident.

68. Tree-Sparrow. *Passer montanus* (Linn.)

A winter visitor, and as a rule by no means common. It comes in small parties in October. I have never found it breeding in Kent. The specimens on record have all been taken in the northern portion of the county.

69. Chaffinch. *Fringilla cœlebs*, Linn.

A well distributed resident, its numbers remaining constant throughout the year. In October a congregating movement is noticed, the flocks frequenting our stubble fields; the sexes then usually keeping apart, although I have sometimes observed them together.

70. Brambling. *Fringilla montifringilla*, Linn.

An occasional visitor in winter, especially in severe weather. It sometimes remains with us as late as March. I have seldom met with this species. In the beech districts it is abundant in good beechmast years.

71. Linnet. *Linota cannabina* (Linn.)

A well distributed resident throughout the county. At the end of August linnets resort in large flocks to our fallow fields, especially where charlock grows. Towards the end of September our inland localities are deserted for the vicinity of the south coast, where large flocks congregate close to the beach, remaining there till their moult is completed before resuming their migration southward. In Kent the nest is frequently built in the upper

bine of the hop plant. During winter the linnet is sparsely distributed throughout the county.

72. Mealy Redpoll. *Linota linaria* (Linn.)

An irregular winter visitor. In November 1895 large flocks appeared on the hills near Dover. Numbers fell victims to the bird-catchers. On 28 September 1899 I obtained a specimen near Lydd out of a flock of linnets.

73. Lesser Redpoll. *Linota rufescens* (Vieillot)

A winter visitor chiefly, some years more plentiful than in others. As a breeding species it is very local. The nest has been taken near Tunbridge Wells, 18 May 1863 (Wharton, *Zool.* p. 8951). On 6 June 1895 I found a nest near Cranbrook. It was placed in the upper branches of a small thick hazel 'tot' in a copse. A nest containing five eggs was taken in the cemetery at Maidstone in May 1898. It is now in the museum of that town. Towards the end of December this species is most in evidence, frequenting our woods in small flocks, especially where the silver birch and hornbeam grow. In the Cranbrook district a great many of these trees within the last two years have been planted and the flocks of redpolls have increased. I am convinced that this species will become a regular breeder before long in the Weald.

74. Twite. *Linota flavirostris* (Linn.)

Occurs in winter in the vicinity of the shore-line. It is a regular visitor to our marshes, appearing about the beginning of October and feeding chiefly upon the seeds of the marsh plants which are covered at the spring tides. In November I have seen small parties in company with linnets frequenting the long 'spiky' grass on the sand dunes near Rye harbour. Mr. Bristow of St. Leonards has specimens frequently from the Sussex coast.

75. Bullfinch. *Pyrrhula europæa*, Vieillot.

A well known resident, more numerous than formerly. Three years ago its ranks were decidedly thinned owing to the existence of sparrow-clubs, which are not so much in fashion now. In 1895 the sparrow-club at Sissinghurst gave as much as 3*d.* per head for every bullfinch taken. During that summer one lad alone sent up ninety-seven heads. Throughout the winter the bullfinches resort in small parties, chiefly consisting of females, to our woods and copses, coming to the orchards in spring.

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76. Crossbill. *Loxia curvirostra*, Linn.

A spring and autumn visitant of irregular occurrence, remaining frequently for some weeks in the favoured locality. In November 1898 small parties were observed near Cranbrook. Several specimens were obtained and also from the neighbourhood of Hawk-hurst. These parties were noticed from time to time in the locality till late in the following spring. On 27 July 1868 a pair of fine adult birds were seen by Mr. Oxenden Hammond at Wingham. There is not a doubt that this crossbill breeds occasionally in Kent, and there is an instance on record (Harting, *Handbook Brit. Birds*, 1901, p. 89); at the best however the nesting of this species in Kent can only be regarded as of very exceptional occurrence. There are not enough pines and fir woods in this county to attract this species. In the Maidstone Museum there is a young crossbill which was killed by a boy with a stone on the Loose Road near Maidstone on 25 May 1899.

77. The Two-barred Crossbill. *Loxia bifasciata* (C. L. Brehm)

On 26 December 1902 a female specimen of this rare wanderer was shot by Mr. H. Dale on Cold Blow farm, Woodchurch, and was exhibited by Mr. N. F. Ticehurst at the British Ornithologists' Club on 18 February 1903. The bird is now in my collection. This is the first recorded occurrence for Kent.

78. Corn-Bunting. *Emberiza miliaria*, Linn.
Locally, Bunting Lark.

A resident, but distributed sparingly on the low ground near the coast, frequenting the clover and pea fields, where it breeds. The bird is decidedly uncommon in the interior of the county. I have found nests near Lydd. Towards the end of September a migration movement takes place, and then these buntings may be found consorting with flocks of linnets near the shore-line. Very few stay with us throughout the winter.

79. Yellow Hammer. *Emberiza citrinella*, Linn.

A common resident. Congregates in winter on the stubble fields.

80. Cirl Bunting. *Emberiza cirlus*, Linn.

A resident but of local distribution. Mr. Prentis writes: 'There is only one patch in my district where the cirl bunting is to be found. I once found a nest containing eggs in an old dried-up decoy pond; it was built on the ground amongst the dead stems of

the reeds. This bird is sometimes taken by the bird-catchers in winter.'

81. Ortolan. *Emberiza hortulana*, Linn.

This is one of those birds whose occurrence must be looked upon with a certain amount of suspicion, since numbers are annually imported from the continent and escapes are notorious. There is however a genuine example in the collection of Mr. Prentis obtained in 1874 near Dover and preserved by Mr. Charles Gordon of the Dover Museum. This bunting is an irregular spring and autumn visitor.

82. Reed-Bunting. *Emberiza schoeniclus*, Linn.

A well distributed resident in the vicinity of the coast, breeding in the osiers and sedges of our marsh land. At the end of August migration takes place and large flocks people the reed beds and dykes on the south coast till the end of September. In winter it is distributed sparingly. Its numbers in the interior of the county at that season have increased very much of late owing to the increase of young larch plantations, which these birds seem fond of haunting.

83. Snow-Bunting. *Plectrophenax nivalis* (Linn.)

A cold weather visitor of uncertain occurrence on our shore-line. Small flocks, chiefly immature birds, appear in November and December. They are often to be found in company with larks on the stubble fields close to the shore.

84. Lapland Bunting. *Calcarius lapponicus* (Linn.)

A rare visitor in autumn and winter on our coast. In Mr. Oxenden Hammond's collection there is a specimen obtained near Wingham in November 1882. I have also examined two specimens in Mr. Prentis' collection, killed near Dover in 1872 and 1890 respectively. In the latter specimen there is a considerable amount of black on the chest, while the breast is whitish.

85. Starling. *Sturnus vulgaris*, Linn.
Locally, Stare.

An abundant resident. A migration movement takes place in autumn, when throughout September enormous flocks frequent our marsh land both on the north and south coast prior to leaving the county, the direction generally taken being to the south-westward. During severe droughts our currant and raspberry bushes are attacked by this bird. In early spring a return migration takes place,

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but not on half such a big scale. In the collection of Mr. Prentis there is a cream-coloured variety. Such specimens, as well as albinisms, occur occasionally.

86. Rose-coloured Starling. *Pastor roseus* (Linn.)

A visitor of rare occurrence. In the Maidstone Museum there is a specimen obtained in the neighbourhood in 1863. In 1889 Mr. Hammond of St. Alban's Court obtained a fine adult specimen near Godmersham; it is now in his collection. In the summer of 1889 another specimen was obtained at Godmersham and examined in the flesh by Mr. Gordon of the Dover Museum (*Zool.* 1889, p. 185). On 14 May 1901 an adult male was shot near Appledore and is now in my collection. In the collection of Mr. Prentis there is a specimen obtained at Wye.

87. Chough. *Pyrrhocorax graculus* (Linn.)

In his *History of Sandwich* Dr. Boys mentions the chough in his list of Kent birds. It was many years ago a resident in Sussex, and therefore it is not unlikely it was also found in those days in Kent inhabiting probably the Dover cliffs. It is a curious thing, but in the arms of the see of Canterbury three choughs are shown. When the late Archbishop Benson came from Cornwall he said that he had come from the home of the chough to find the bird engraved on his coat-of-arms at Canterbury.

88. Nutcracker. *Nucifraga caryocatactes* (Linn.)

A visitor of rare occurrence. There are two records: one, Kent (Latham, *Synopsis*, i. 400, 1781); one near Eddington, Kent, 17 November 1885 (*Zool.* 1885, p. 480).

89. Jay. *Garrulus glandarius* (Linn.)

This bird is still plentiful throughout the county, but not so abundant as it used to be, for where game is preserved the woods are searched by the keepers in a most systematic manner, and as soon as the young are hatched they and the parent birds are killed. Partial migrations occur in autumn, and the number of home-bred birds are augmented by foreigners during the winter months.

90. Magpie. *Pica rustica* (Scopoli)

A resident, less numerous than formerly. The remarks on the jay apply equally to this species.

91. Jackdaw. *Corvus monedula*, Linn.

Locally, Daw.

A resident, but locally distributed. It may frequently be found nesting in holes in trees

close to rookeries. The jackdaws return to their nesting localities early in March, the majority not remaining with us throughout the winter. A remarkable instance of the sagacity of this species occurred near Cranbrook in 1895. A pair had a nest and the eggs were taken. The birds deserted the nest-hole and straightway took to another tree about 500 yards distant. In this the two remaining eggs were laid. These were smeared all over with a thick coating of mud, which made it difficult to detect them in the nest.

92. Raven. *Corvus corax*, Linn.

Seldom, if ever, met with now.

93. Carrion-Crow. *Corvus corone*, Linn.

A resident, but getting scarcer every year. Owing to the more thorough system of farming nowadays, which restricts the food of this species, and persecution by gamekeepers, it seldom breeds now in our woods. In May 1894 I found a nest in the Bedgebury woods near Cranbrook.

94. Hooded Crow. *Corvus cornix*, Linn.

Locally, Dun Crow, Saddle-back.

A regular winter visitor, arriving on our shores towards the end of October, the majority appearing later—in November. These birds generally remain throughout the winter about our marshes and the vicinity of the coast, but if the weather is severe and rough they pass further inland to more sheltered situations. They roost at night in the woods, and at first streak of dawn wend their way to the marshes, where they remain till dusk. They delight in 'sprat' fields, where they gorge themselves on the manure. At the beginning of April the migration northward is resumed. Small parties appear occasionally in winter in the Weald, but not often. Over the wooded districts they fly high and seldom stop by the way.

95. Rook. *Corvus frugilegus*, Linn.

An abundant resident, increasing annually. In the Cranbrook district the nests have overflowed into the woods greatly to the dismay of the keepers.

In August the rooks leave their nest-trees and migrate with their young to the vicinity of the sea-coast, a few returning again in October, the majority at the end of January, when the large rookeries present sometimes wonderful spectacles of animation. The following is from my diary: 'Feb. 10 1899. I saw a wonderful sight this evening. While passing Hemstead, the group of trees

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in the hollow below the house presented an extraordinary appearance. Above them in the air, circled backwards and forwards myriads of rooks, all "cawing," and so much in unison that it sounded like the sound of the incoming tide. This was about 6 o'clock. Only now and again this even sound would be broken by the higher pitched voices of the jackdaws. A large rookery exists in these trees and is of many years' standing.'

96. Sky-Lark. *Alauda arvensis*, Linn.

A well known resident. In September a congregating movement takes place and the birds frequent the newly-cut stubble fields in flocks. Towards the fall of the year our numbers are augmented by 'foreigners,' who frequent our hop gardens, picking up a livelihood among the manure heaps put out by the farmer. When there is a thick fall of snow they disappear, but come back again as soon as the weather becomes open.

97. Wood-Lark. *Alauda arborea*, Linn.

By no means a common bird, and locally distributed during the breeding season in the woods of the Weald. I have found the nest occasionally in the woods near Cranbrook. In the Rainham district it is met with in winter (Prentis); and about Stourmouth it has been seen at the same season in small flocks (Dowker).

98. White-winged Lark. *Alauda sibirica*, J. F. Gmelin.

A very rare visitor. On 27 January 1902 a male specimen was obtained at Woodchurch by a man named Ward, and another, a female, the following day. A third individual was seen and obtained later, on 22 March. Two examples were exhibited on 19 February at the British Ornithologists' Club by Mr. N. F. Ticehurst. These are the first records of this bird for Kent, while only one previous example is known from the British Isles, viz. a bird caught alive on 22 November 1869, near Brighton, and exhibited at a meeting of the Zoological Society of London.

99. Shore-Lark. *Otocorys alpestris* (Linn.)

An irregular winter visitor. In February 1861 five specimens were shot in the neighbourhood of Sheerness (*Zool.* 1861, p. 7709). There are a pair from Lydd in the Plumley collection, Dover Museum, and according to Mr. Gray, the curator, it not unfrequently occurs at Dover. In the collection of Mr. Prentis there are two specimens obtained in the Rainham district in 1880 and 1889.

100. Swift. *Cypselus apus* (Linn.)

A well distributed summer visitor. Fond of breeding in the cowl of our oast-houses and in our church towers. When on migration they make no stay in the vicinity of our coast line, as the swallows do.

101. Alpine Swift. *Cypselus melba* (Linn.)

A rare visitor. On 20 August 1830 one was obtained at Dover (*Notebook of a Naturalist*, p. 226). In June 1871 another was seen in Kent and reported in the *Zoologist*, 1876, p. 5046 (Gurney).

102. Nightjar. *Caprimulgus europæus*, Linn.

Locally, Night-hawk, Evejar.

Of local distribution, but plentiful in the woods of the Weald, where it breeds in large colonies, especially where there is water and an undergrowth of bracken. It arrives in the county about the middle of May and leaves early in September. Nestlings of this species are frequently found late in autumn. One was taken near Sissinghurst on 10 August.

103. Wryneck. *Ijnx torquilla*, Linn.

Locally, Snake Bird.

A regular spring migrant. Well distributed in the wooded districts, and where there are orchards and pollard trees.

104. Green Woodpecker. *Gecinus viridis* (Linn.)

Locally, Galley-bird.

Locally distributed in the wooded districts. More numerous in winter than in summer. In some districts it has largely increased, while in others, where it was formerly common, it has decreased. This is the case in the Cranbrook district, and I attribute it to the great increase of starlings within the last few years, which invade our woods and take possession of the nest-holes bored by the green woodpecker. The plagues of the small oak-green caterpillar and other arboreal insects, experienced within the last few years, have caused large numbers of starlings to breed in the woods. These birds are not slow to take advantage of the old homes of the woodpeckers; and they even engage in pitched battles with them over their newly-made holes. It is not unusual to find this woodpecker resorting to the same nest-site of the previous year. In this instance the old hole is deepened. The drilling of a new one is accomplished generally by the tenth day, but the time varies according to the nature of the tree. The process of boring, as a rule, takes place during the small hours of the morning. During the day the hole is left, and not re-

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turned to till the following morning. The starling in the meantime fills the newly-drilled hole with straw and takes possession of the nest-site.

105. Great Spotted Woodpecker. *Dendrocopus major* (Linn.)

Locally, Magpie Galley-bird, Galley-Magpie, French Magpie.

Found in the wooded districts, but sparingly distributed. Certain woods in the Cranbrook district are never without a pair. Partial migrations occur in October, the birds bred in a district not remaining throughout the winter, but returning in March to their old haunts, where I have taken nests several years in succession.

106. Lesser Spotted Woodpecker. *Dendrocopus minor* (Linn.)

A resident, but sparingly distributed. In spring its peculiar drilling tap against the trees is occasionally heard. It is a difficult bird to observe, and this is the only time of the year its distribution can be arrived at. Owing to its shy habits this woodpecker is more common in some districts than it appears to be.

107. Kingfisher. *Alcedo ispida*, Linn.

A resident, distributed along our trout streams and rivers. A few years ago it was getting scarce, but its numbers have since rallied. In severe winters our resident birds are augmented by migrants, and I am sorry to say numbers are killed. Every December Mr. Springett, the taxidermist of Cranbrook, has sent him quite a number of these birds by the local farmers. In summer, during severe droughts, and in autumn, partial migrations occur to our marsh land in the vicinity of the sea-coast. I have found its nest on several occasions near Cranbrook.

108. Roller. *Coracias garrulus*, Linn.

A rare migrant in spring and autumn. A roller was taken alive on the Rainham marshes on 8 November 1888. I have examined this specimen, which is in the collection of Mr. Prentis.

109. Bee-eater. *Merops apiaster*, Linn.

A rare summer visitor. There is a specimen in the Plomley collection from Lydd in 1844.

110. Hoopoe. *Upupa epops*, Linn.

An irregular migrant, generally noticed in spring, but sometimes in autumn and even in winter. The individuals which appear on our coasts are invariably shot, otherwise there

is no doubt they would breed in the county. I have no direct evidence of this species having nested in Kent, although it has done so in Sussex. On 12 May 1861 an adult female was taken on Plumstead Common with ovaries fully developed.

111. Cuckoo. *Cuculus canorus*, Linn.

A well distributed summer migrant, its numbers varying however in different years according to the abundance of insect life. In his 'Notes on the birds observed at Rainham,' *Zoologist*, March 1865, Mr. Power writes: 'In this district, the number of cuckoos varies with the presence or absence of a caterpillar that feeds upon the gooseberry leaves. In some seasons, these caterpillars infest the bushes in myriads, and at such times the cuckoos abound in the plantations. About the beginning of July, the cuckoos collect in the plantations near the river Medway, and often take long flights out over the marshes, on which they sometimes settle to feed upon a species of caterpillar at this time to be found on the marsh plants.' At the end of July the cuckoos commence to leave the county, the old birds departing first.

112. White or Barn Owl. *Strix flammea*, Linn.

A common resident. The numbers of our home birds are augmented in late autumn by migrants. Numbers are caught at this time of the year and sent to the local bird stuffers.

113. Long-eared Owl. *Asio otus* (Linn.)

Very locally distributed in the wooded districts. More an autumn migrant than a resident.

114. Short-eared Owl. *Asio accipitrinus* (Pallas)

An autumn migrant. Frequently observed on our marsh lands. I have had specimens from the low-lying ground near Ashford. It has bred near Rainham (*Birds of Rainham*, Prentis, p. 16).

115. Tawny Owl. *Syrnium aluco* (Linn.)

Locally distributed in our woods, but by no means common. All the specimens I have seen from Kent are the ash-grey variety. In some localities it has greatly increased, the red and brown phases being the commonest by far.

116. Tengmalm's Owl. *Nyctala tengmalmi* (J. F. Gmelin)

Very rare. There are two recorded occurrences: one in May 1836 (Yarrell, *History of British Birds*, ed. 3, i. 163); one, Dartford,

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Kent, November 1881 (*Field*, 18 November 1881).

117. Little Owl. *Athene noctua* (Scopoli)

An accidental visitor. It is difficult to say whether the examples taken from time to time in England are really wild or not, since many are imported from the continent into this county and purposely liberated. Mr. Meade-Waldo has thoroughly established this bird as an introduced species at Stonewall Park, Edenbridge. In that district it breeds in holes in old apple trees and under the roots of trees overhanging the railway embankments. In May 1856 one was taken alive at Maidstone (*Zool.* 1856, p. 5159). Another at Sevenoaks, Kent, 1862, formerly in the collection of the late F. Bond. One near Maidstone (Dover Museum). I have also examined another specimen taken some years ago at Hythe, and belonging to a barber in that town. In August 1894 another was obtained at Maidstone (Allchin, *Science Gossip*, September 1894, p. 159). On 24 October 1902 a female was shot in the Angley woods, Cranbrook, and preserved by Mr. Springett of that town.

118. Eagle-Owl. *Bubo ignavus*, T. Forster.

A rare migrant. One in Kent, recorded by Latham in the first supplement of his *Synopsis*.

119. Marsh-Harrier. *Circus aeruginosus* (Linn.)

Seldom obtained now. It formerly haunted our marshes before drainage was commenced. In the 'fifties' this bird was often seen in Romney Marsh. There are two specimens from that locality probably obtained about that time in the Plumley collection, Dover Museum. In June 1867 a fine adult was killed at Rainham (Prentis).

120. Hen-Harrier. *Circus cyaneus* (Linn.)

A scarce migrant in autumn, when immature birds are sometimes obtained. I have an adult female, killed at Staplehurst in November 1892. Old males in the grey plumage are very rare. I have seen a specimen, obtained in Romney Marsh many years ago; it was the property of Mr. J. D. Walker of New Romney. At his death it was sold and passed into the collection of Mr. Harrison of Folkestone.

121. Montagu's Harrier. *Circus cineraceus* (Montagu)

A spring migrant, occurring fairly frequently in the northern portion of the county. In the collection of Mr. Prentis there are seven specimens, varying from a sooty black

to a light brown, obtained in May, June and July, from 1866 to 1870, 1888 and 1898 respectively. This species has bred in the county near Wingham (Oxenden Hammond, *Zool.* 1897, p. 363).

122. Buzzard. *Buteo vulgaris*, Leach.

An autumn and winter visitor of irregular occurrence. In November 1870 a large visitation took place. Near Canterbury, on the Godmersham and Chilham estates alone, eight specimens were obtained (Gordon, *Zool.* 1871, p. 2439). In December 1895 another visitation, but in a lesser degree, occurred, when several specimens were obtained near Cranbrook and in other parts of the county. The autumn migration chiefly consists of young birds of the year, the adults being seldom met with. When on migration, I have seen this buzzard soar to a great height, and then its flight now and again becomes a series of graceful curves and gyrations. But when a temporary halting-place is taken up, the flight is slow and sluggish, and seldom higher than the tree-tops, the bird working backwards and forwards after its prey over the same ground diurnally. At dusk, it seems more alert than during the day—a sombre-feathered form, it appears, as it looms and glides past the tree-trunks and over the russet-clad undergrowth in almost noiseless fashion, more after the manner of an owl than a hawk. Owing to the large increase of pheasant-rearing, this bird is ruthlessly trapped and shot. But for this, there is not a doubt that these birds would stay throughout the winter and breed in the Kentish woods.

123. Rough-legged Buzzard. *Buteo lagopus* (J. F. Gmelin)

A rare autumn visitor to the vicinity of our coast. I have a fine adult female, shot on the Lydd beach 30 October 1895. In the same winter another was obtained near Eastwell, Ashford. It has occurred at Rainham (Prentis).

124. White-tailed Eagle. *Haliaeetus albicilla* (Linn.)

Immature birds on migration not unfrequently occur in the county, generally in November and December, and seldom escape being shot. Of late years the following are the authentic records: In November 1879 a pair appeared in the Rainham district, of which one was shot. In early November 1885 a fine female was obtained at Minster and is now in the Canterbury Museum. About the same time another bird, a male, was killed at Eastwell Park near Ashford. At

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the same place a male was shot on 11 December 1894, and on the following day a female was taken near Ramsgate. Lastly, in 1897, a male bird was killed in Penshurst Park.

N.B.—The Golden Eagle has never been identified in the county; birds recorded under this name having proved to be immature examples of the white-tailed eagle.

125. Goshawk. *Astur palumbarius* (Linn.)

This is another rare visitor to the county. I have only two records. An adult female was killed at Tredville Park near Wingham in the time of the late owner, Mr. Plumtre. It is still in the house, and in good preservation. The other record of its appearance dates back as far as May, 1844, at Swingfield near Dover.

126. Sparrow-Hawk. *Accipiter nisus* (Linn.)

This hawk is getting scarce, breeding now sparingly in the Weald. The thick portions of the Bedgebury and Hemsted woods near Cranbrook often defy the keepers' search, and consequently not a few broods, reared in these localities, escape at least premature destruction. During the winter the old nest is resorted to as a roosting place, and in this way the birds often fall victims to the trap placed on the nest by the keepers. In the autumn the majority of the individuals bred in the thick woods leave and frequent the less enclosed portions of the county.

127. Kite. *Milvus icinus*, Savigny.

Very rare. At the beginning of the eighteenth century this magnificent bird was common, but owing to cultivation, the increase of game preservation and the greed of collectors, it is no longer met with in the county. In the Plomley collection, Dover Museum, there are two specimens, obtained many years ago near Lydd. Mr. Meade-Waldo informs me that in September 1877 he observed a kite on three occasions near Edenbridge. In 1889 an adult male was killed near Stourmouth, and is the property of Mr. J. C. Kay of Godmersham (Dowker).

128. Honey-Buzzard. *Pernis apivorus* (Linn.)

An occasional visitor on migration, generally in August and September, when stragglers find their way to our wooded districts.

129. Peregrine Falcon. *Falco peregrinus*, Tunstall.

This falcon still breeds in the inaccessible portions of the Dover cliffs, and Mr. Gray, of the Dover Museum, informed me that no fewer than three pairs nested in 1899 in the

district. One nest was, unfortunately, thrown down by a partial landslip. The eggs, though much damaged, have been preserved and are now in the museum. This falcon is observed from time to time in the vicinity of our estuaries and the shore line. The writer has seen this species on the Lydd beach, pursuing and dogging the large flocks of starlings that congregate there in October during the migration period.

130. Hobby. *Falco subbuteo*, Linn.

An occasional summer visitor to Kent. I have no record of its breeding with us. In June 1864 a male hobby was shot in a cherry orchard near Sittingbourne, and the female was seen (Prentis). I have an adult male in my collection, obtained at Eastwell in May, 1894.

131. Merlin. *Falco æsalon*, Tunstall.

Uncommon; met with in the county during the autumn and winter months. This falcon is more often observed on our marshes, where it preys upon waders and starlings.

132. Red-footed Falcon. *Falco vespertinus*, Linn.

Very rare. There is only one occurrence for Kent. In the early summer of 1862 an adult female was taken at Sandling Park near Hythe (Hammond, *Zool.* 1862, p. 8192). This falcon is sometimes named the orange-legged hobby.

133. Kestrel. *Falco tinnunculus*, Linn.

This is our common hawk, but of late years its numbers have been sadly reduced owing to its persecution by gamekeepers. In the autumn a certain number leave us. They may frequently be observed on the Lydd beach at the end of September prior to crossing the Channel. This bird sometimes selects curious sites for its nest. In 1876, at Bromley, Kent, a nest was taken in a hollow tree containing six eggs—an unusual number (*Field*, 3 June 1876). From Edenbridge Mr. Meade-Waldo writes: 'With me, many nest in hollow trees, and annually in the boxes placed to accommodate owls.'

134. Lesser Kestrel. *Falco cenchris*, Naumann.

Only one example of this extremely rare kestrel has been obtained in the county. In May 1877 an adult female was taken alive near Dover and kept for some time in confinement (Gordon, *Zool.* 1877, p. 298); the specimen is now in the Dover Museum.

135. Osprey. *Pandion haliaëtus* (Linn.)

A rare visitor to Kent. It has been

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observed and shot near Rainham (Prentis), on the Isle of Thanet (Dowker), near Maidstone (*Field*, 15 September 1894). In May 1901 a fine adult male was shot on Bedgebury lake near Cranbrook and preserved by Mr. Springett, the taxidermist of that town. A year previous to this occurrence another was seen in the same locality.

136. Cormorant. *Phalacrocorax carbo* (Linn.)
Locally, Isle of Wight Parson.

A visitor to our coast line. It is found on the Medway. A fine male example in full breeding dress is in the Dover Museum, taken near the Dover coal mine, 2 February 1898.

137. Shag or Green Cormorant. *Phalacrocorax graculus* (Linn.)

Occurs at sea off our south coast, generally young birds, during winter.

138. Gannet or Solan-goose. *Sula bassana* (Linn.)

An occasional winter visitor. Storm-driven individuals have occurred on the coast.

139. Common Heron. *Ardea cinerea*, Linn.

A resident, though not so numerous as formerly. From May onwards young birds come to the dykes and shallow pools in our marsh land in search of eels, and in dry seasons considerable migrations occur. In the spring adult birds are sometimes obtained along running brooks inland. The majority of birds leave us in late autumn, returning to the heronries in February. There are two of these in the county: one at Cobham near Gravesend and the other at Chilham Castle—a well known heronry which has been in existence for over 120 years, and where the nests are built in tall ash and beech trees. The fine heronry in Penshurst Park was abandoned by the herons, owing to the increase of rooks and jackdaws about 1840.

140. Purple Heron. *Ardea purpurea*, Linn.

A rare visitor. I have no recorded occurrence of late years. In September 1838 an immature specimen was obtained in Romney Marsh, and in the same locality a fine adult on 29 March 1847 which is now in the Dover Museum (Plomley, *Zool.* 1847, p. 1777). In the Prentis collection there is an immature specimen, shot near Ham Street in 1876.¹

141. Night-Heron. *Nycticorax griseus* (Linn.)

A rare visitor. In the Plomley collection,

¹ There is a specimen of the buff-backed heron (*A. bubulcus*) in the Maidstone Museum, but I have been unable to trace its history.

Dover Museum, there is a specimen obtained many years ago from Lydd.

142. Little Bittern. *Ardetta minuta* (Linn.)

Has been obtained occasionally, generally in autumn, but not of late years. It has been shot at Elmstone (Delmar) and near Ashford in 1877 (Prentis collection).

143. Bittern. *Botaurus stellaris* (Linn.)

Comes to us occasionally during severe winters. Before the epoch of cultivation and drainage it probably bred in our marshes. It has been obtained at Rainham (Prentis), at Stourmouth (Dowker), at Orpington (male, January 1864, *Zool.* p. 8961), at Headcorn (Maidston Museum), at Lydd (Plomley collection), and in the Cranbrook district, where on 23 December 1897, at Horsemonden, an adult male was shot, and another male on 13 December 1899 in the Glassenbury woods.

144. American Bittern. *Botaurus lentiginosus* (Montagu)

A rare straggler. In 1854 an individual was shot near Canterbury and is now in the museum of that town. It was identified some years afterwards by Mr. J. H. Gurney (*Zool.* 1866, p. 145).

145. White Stork. *Ciconia alba*, Bechstein.

A rare accidental visitor. There is a specimen in the Plomley collection in the Dover Museum, and it was probably obtained at Lydd. It has also occurred at Sandwich (Boys' List, *History of Sandwich*).

146. Black Stork. *Ciconia nigra* (Linn.)

A rare accidental visitor. There are only two satisfactory records—one from Romney Marsh in 1844 (it is in the collection of Mr. Thornhill of Riddlesworth); another near Lydd 5 May, 1856 (*Zool.* 1856, p. 5160).

147. Spoonbill. *Platalea leucorodia*, Linn.

Now only a rare visitor to the county, the occurrences of late years being less numerous than formerly. Though there is no direct evidence that this bird ever bred in Kent, yet it is more than likely, since breeding stations existed in the adjoining counties of Sussex and Middlesex (Harting, vol. ii. 1877, p. 425; 1886, p. 81). In June 1850 a flock of six spoonbills visited Sandwich Haven, and about the same time three more were seen in Pegwell Bay, while another individual probably of the same flock was shot in the Wingham marshes (*Zool.* 1850, p. 2853).

Mr. Prentis writes: 'A fine female adult spoonbill with a buff collar and pendant crest was shot on the Isle of Elmley 12 April 1865.

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Immature specimens have been met with on three occasions on the marshes near the river Medway.' This bird has also been obtained in the Sittingbourne district (Dowker).

The favourite locality for this species is, or rather was, the broad tract of stones, relieved here and there by large ponds, known as the Lydd beach.

I have the following records from this locality: One specimen in the Plumley Museum; two in Mr. Blacklock's house at Lydd, preserved some years ago by Mr. Jell, the local birdstuffer. On 9 May 1889 two adult males were shot by two of the Southerdens family. One of these is now in my collection; the other was sold to Mr. Gray of Dover for £7. In June 1890 a party of five appeared, but to use the words of the fishermen, 'We were too greedy, we wanted the "blooming" lot, and ended by getting none.' On 24 May 1891 an immature bird was obtained. There is another still in the possession of the Southerdens, shot some twenty years ago. This specimen is a very perfect one. The broad suffused rust-coloured ring is remarkable for its intensity. On 12 June 1896 a single individual appeared near the Midrips,¹ in company with five herons. The above records will show that the visits of the spoonbill have become fewer and farther between of late years. I have observed this species sometimes on the sands in company with gulls.

148. Flamingo. *Phoenicopterus roseus*, Pallas.

There is only one reliable record from Kent. On 12 August 1884, when Captain G. E. Shelley, the well known ornithologist, was waiting near New Romney for the evening flights of curlews, an adult flamingo flew past him, having been put up by his two nephews, who got within about fifty yards of it (Howard Saunders, *Man. Brit. Birds*, 1898, p. 395).

149. White-Fronted Goose. *Anser albifrons* (Scopoli)

Locally, Speckled-belly Goose.

A regular winter visitor. There are three specimens from Lydd in the Maidstone Museum, and another in the Folkestone collection, taken on the Warren, Dover.

150. Bean-Goose. *Anser segetum* (J. F. Gmelin)

Locally, Gray Goose.

Comes to us in the winter, and next to the

¹ These are a series of shallow ponds on the Lydd beach.

brent goose is the most common of all the geese, visiting the mouths of our rivers and the 'petts' in the marsh land.

151. Pink-footed Goose. *Anser brachyrhynchus*, Baillon.

Locally, Gray Goose.

An irregular winter visitor. There are two specimens from Lydd in the Maidstone Museum. Another example was obtained at Preston in January 1887 (Dowker).

152. Barnacle-Goose. *Bernicla leucopsis* (Bechstein)

I have no recorded occurrence of this goose. There is a specimen in the Folkestone Museum which was probably locally taken. Mr. George Dowker says: 'This species is mostly found at sea.'

153. Brent Goose. *Bernicla brenta* (Pallas)

Locally, Clattergoose.

Abundant. In severe winters they come to our creeks and mud-flats in large parties. In March a migration southward may be noticed, the birds travelling high overhead in wedge-shaped batches, but seldom stopping by the way.

154. Whooper Swan. *Cygnus musicus*, Bechstein.

Locally, Wild Swan.

Small batches of four to five birds occasionally appear on the sands at low water between Rye Harbour and Lydd during the winter. It occurs also occasionally inland. The last appearance I have on record was in November 1896, when a party of three appeared close to Rye Harbour. Two of these were shot. It has been obtained at Stourmouth (Dowker).

155. Bewick's Swan. *Cygnus bewicki*, Yarrell.

Locally, Tame Swan.

An occasional visitor. It has been obtained at Lydd (Plumley collection), at Wingham (Oxenden Hammond), and at Rainham, where a fine female example was killed on 22 January 1879 (Prentis).

156. Common Sheld-Duck. *Tadorna cornuta* (S. G. Gmelin)

Locally, Bar-gander.

A fairly common winter visitor to our creeks and brackish waters near the sea. Owing to the drainage of our marshes it is not so numerous as formerly.

157. Ruddy Sheld-Duck. *Tadorna casarca* (Linn.)

A rare winter migrant. On 8 September

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1884 a party of four appeared in Romney Marsh. One of these was shot (Thomas Parkin, *Zool.* 1884, p. 469). Another example, obtained near Cranbrook in March 1893 and now in my collection, was preserved by Mr. Springett of Cranbrook.

158. Mallard or Wild Duck. *Anas boscas*, Linn.

A resident, breeding in our marshes. In severe winters the inland ponds and streams are visited by migrants. Many are kept in semi-captivity on the large estates in the county. In February 1889 an albino specimen was obtained at Stourmouth, and on 10 January 1900 Mr. Springett of Cranbrook received from Sandhurst, Kent, a hybrid between this species and the pintail duck.

159. Gadwall. *Anas strepera*, Linn.
Locally, Bastard.

A rare winter visitor to Kent. On 22 February 1845 an adult male was shot in Romney Marsh (*Zool.* p. 1025). It has also occurred at Sandwich (Boys' List). In December 1896 an adult female was obtained near the Fleet Pond, Rye, and is now in my collection.

160. Shoveler. *Spatula clypeata* (Linn.)
Locally, Spoonbill.

Scarce and generally observed in winter. In the Maidstone Museum there are a pair of shovelers from Gillingham, and in the Plomley collection two male birds from Lydd. This duck has lately been discovered breeding in Romney Marsh (Ticehurst, *Zool.* 1900, p. 279). Yarrell stated that this locality was formerly a breeding haunt.

161. Pintail. *Dafila acuta* (Linn.)

A regular winter visitor. During a severe winter it is met with in considerable numbers near Lydd and on the salt marshes about the Medway.

162. Teal. *Nettion crecca* (Linn.)

Found in winter on our marshes, but inland it is less numerous. I have only three records from the Cranbrook district. It occurs every year on the Eden, and some pairs breed annually about the ponds and petts on the Sussex border. At the end of September small 'bunches' of teal in company with wigeon arrive on the sheltered ponds that lie back from our shore line.

163. Garganey. *Querquedula circia* (Linn.)

A rare spring migrant. In May 1900 two nests of this species were found in Rom-

ney Marsh by Mr. N. F. Ticehurst of St. Leonards (*Zool.* 1900, p. 279). In the Plomley collection there are three specimens obtained from Lydd in March 1840. There is another from the same locality in the house of Mr. Southerden, Jury's Gap, Lydd. Mr. Southerden tells me that ten years ago this duck came regularly to the Lydd beach every spring. There is hardly any doubt that it bred in the neighbourhood in those times, as it has been found to do so now.

164. Wigeon. *Mareca penelope* (Linn.)
Locally, Frosted Duck, Cock-winder.

Common in the vicinity of the coast, but inland its occurrence is unusual. At the end of September individuals, chiefly immature birds, begin to come in to our marsh pools and brackish waters, followed by greater numbers at the fall of the year according to the severity of the weather.

165. Pochard. *Fuligula ferina* (Linn.)
Locally, Snuffle-headed Wigeon.

Only occasionally met with now during hard winters. Formerly this duck was plentiful about the Lydd 'petts' and Romney Marsh. Some ten years ago, when the Southerden brothers carried on a trade in their duck-shooting, the pochard was well represented in their 'bags.'

166. Tufted Duck. *Fuligula cristata* (Leach)
Locally, Least Wigeon.

Found in our creeks and marshes in the winter. Not uncommon. It has been obtained at Sheerness (Maidstone Museum), at Rainham (Prentis), Stourmouth (Dowker) and Lydd (Plomley).

167. Scaup-Duck. *Fuligula marila* (Linn.)
Locally, Sea-Wigeon.

Met with in winter on our salt marshes and at the mouths of our estuaries. It has been obtained at Stourmouth (Dowker), on the Lower and Upper Medway (Meade Waldo), and at Farleigh (Maidstone Museum), also at Rainham (Prentis).

168. Goldeneye. *Clangula glaucion* (Linn.)
Locally, Spectacle Duck.

By no means common. Young birds and adult females are sometimes obtained in winter on inland ponds and sheltered portions of our rivers. I have two adult females in my collection—one shot at Sittingbourne by Captain Moore, R.N., in March 1894; and the other from Biddenden 30 November 1899.

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169. Long-tailed Duck. *Harelda glacialis* (Linn.)

A scarce winter visitor. Immature specimens are sometimes obtained. I have an adult male shot at sea off Dungeness in February 1895 and an immature female from the lake at Bedgebury Cranbrook, 9 November 1898.

170. Common Eider Duck. *Somateria mollissima* (Linn.)

A rare visitor. There is a specimen in the Plomley collection, obtained at Lydd.

171. Common Scoter. *Ædemia nigra* (Linn.)
Locally, Black Duck.

Common from November onwards, and found in large flocks off the coast between Rye and Dungeness. Also off Herne Bay and Whitstable (Dowker).

172. Velvet Scoter. *Ædemia fusca* (Linn.)
Locally, White-winged Black Duck.

Not so plentiful as the former species. In November I have observed small flocks at sea off the Lydd coast. In the Prentis collection there is a pair obtained in November 1898 on the Medway. I have also a fine adult male shot off Rye.

173. Goosander. *Mergus merganser*, Linn.

Rare. I have never met with this species. In the collection of Mr. Meade-Waldo there is a specimen obtained near Edenbridge.

174. Red-breasted Merganser. *Mergus serrator*, Linn.
Locally, Sawbill.

Not uncommon. Has been obtained at Sheerness (Maidstone Museum), and in the creeks of the Medway (Prentis) during cold weather.

175. Smew. *Mergus albellus*, Linn.
Locally, Small Herring-bar.

The immature or red-headed birds of this species are sometimes met with, rarely the adults. Mr. Prentis records an adult male from Rainham.

176. Ring-Dove or Wood-Pigeon. *Columba palumbus*, Linn.

A well distributed resident, most numerous throughout the Weald. Towards the end of October our homebred birds are augmented by large flocks of migrants, especially when the year has been good for acorns. They invade our woods in enormous flocks at the fall of the year, staying with us for about a month and then leaving.

177. Stock-Dove. *Columba ænas*, Linn.
Locally, Blue Rock.

Locally distributed throughout the year, generally observed singly or in small flocks. In autumn partial migrations occur, when parties may be found on the arable fields near the coast and on our marsh land. In some localities it breeds in rabbit holes.

178. Turtle-Dove. *Turtur communis*, Selby.

A common summer visitor, breeding plentifully in our woods and copses. Some years more numerous than in others.

179. Pallas's Sand-Grouse. *Syrhaptes paradoxus* (Pallas)

A rare accidental visitor. The occurrences in Kent were during the well known invasions of this species to the British Isles—in 1859, 1863 and to a smaller extent in 1888. In November 1859 several specimens were obtained on the sands near Lydd. One of these is in the Maidstone Museum, another in a fisherman's house near Rye. The fisherman, who saw these birds, told me that they appeared on the sands near the dunes after a severe storm, were quite tame, and could have been knocked over with sticks. The next visitation took place in June 1863. On 7 June six birds were seen in the Vale of Elmley, Sheppey. Two of these were shot, a male and female. Two days later another four were seen, and one of these, a female, was obtained. In November 1888 four were seen upon a ploughed field for several days in the parish of Hoo. On 14 December during a thick fog, a male bird was picked up dead, with head cut clean off by the telegraph wires on the Isle of Grain railway.

180. Black Grouse. *Tetrao tetrix*, Linn.

This species existed in Kent in the time of Henry VIII. 'It is in an ordinance for the regulation of the royal household dated from Eltham that the word "Grouse" makes its first appearance in our language as "Grows"' (Howard Saunders, *Man. Brit. Birds*, 1898, p. 493).

In 1853 a grey hen was killed in one of the woods at Hever near Edenbridge, another was also seen (Meade-Waldo). They were still found at that time on Brasted Chart.

181. Pheasant. *Phasianus colchicus*, Linn.

Throughout the Weald the numbers of pheasants yearly increase. In the Cranbrook district, within a radius of ten miles, large numbers running into thousands are annually reared at Bedgebury, Glassenbury, Angley

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and Hemsted. Wild birds have correspondingly increased. In many places the woods are so well stocked that little or no rearing will be found necessary in the near future. The typical *P. colchicus* is rare. The existing race are descendants from the introduction of the Chinese ring-necked *P. torquatus* and the Japanese *P. versicolor*. Hybrids between the latter and Reeve's pheasant have been obtained at Bedgebury, Cranbrook.

182. Common Partridge. *Perdix cinerea*, Latham.

Well distributed both inland and down to the sea coast. It has of late years much increased owing to the increase of young plantations and the practice of 'driving,' which considerably reduces the number of old cock birds. On all the large estates 'driving' takes place in December and January. This sport is producing a wilder and more restless trait in the nature of the species.

183. Red-legged Partridge. *Caccabis rufa* (Linn.)

Since 'driving' was introduced this bird, sometimes known as the 'French partridge,' has decreased. Owing to the habit it has of detaching itself from a covey when being driven, it generally falls a victim to the gun. Its numbers vary yearly, but locally it is common.

184. Quail. *Coturnix communis*, Bonnaterra.

A summer migrant, but seldom met with. In September 1893 an individual was obtained near Benenden. This bird used formerly to breed on several farms in the Weald.

185. Corn-Crake or Land-Rail. *Crex pratensis*, Bechstein.

A summer migrant, breeding sparingly in the county. The bird has been met with as late as December (Prentis). By the end of September the majority have left.

186. Spotted Crake. *Porzana maruetta* (Leach)

An irregular spring and autumn migrant. Before the drainage of our marshes it bred in the county in the neighbourhood of the Thames. There are two specimens in the Maidstone Museum from Hythe.

187. Baillon's Crake. *Porzana bailloni* (Vieillot)

A rare spring and autumn migrant. The late Charles Gordon of the Dover Museum identified a specimen obtained on the Hythe canal in October 1870.

188. Water-Rail. *Rallus aquaticus*, Linn.

There is no evidence of this species having bred in Kent. I have never observed it during the summer; but in winter, especially severe ones, it is frequently met with in December and January.

189. Moor-hen. *Gallinula chloropus* (Linn.)

Locally, Water-hen.

A common resident, its numbers in winter being augmented by migrants, especially if the winter is severe, when our sheltered brooks and ponds become favourite havens.

190. Coot. *Fulica atra*, Linn.

A resident, but of local distribution. Owing to the drainage of our marshes its breeding localities are now restricted. It breeds on the Hoppen Petts near Romney Marsh, also near Leeds Castle, and on the lake at Eastwell Park, Ashford. It is rare at Rainham, but it has bred there (Prentis).

191. Great Bustard. *Otis tarda*, Linn.

A rare visitor, and has not occurred of late years. In the Plomley collection there is an adult female, obtained at Lydd on 4 January 1850. In December 1879 one was shot in Romney Marsh (*Zool.* 1880, p. 110). In January 1880 an adult male was obtained near Wye and an immature female at Great Chart. Both these latter specimens are in the collection of the late Mr. Prentis, who kindly allowed me to examine them. In the Maidstone Museum there is a specimen from Romney Marsh (Simmons). In the Canterbury Museum there is a specimen, probably taken locally. Writing to the *Zoologist* in 1850 (p. 2700) Dr. Plomley says that, from information obtained during many years of residence in Romney Marsh, the great bustard was formerly not uncommon in that locality.

192. Little Bustard. *Otis tetrax*, Linn.

A rare wanderer, and has occurred less frequently than the last named species. In the Plomley collection there is a pair of little bustards taken many years ago at Lydd, and Mr. Dowker mentions one in the Rev. B. Austen's collection, killed in St. Nicholas marshes.

193. Stone - Curlew. *Edicnemus scolopax* (S. G. Gmelin)

Locally, Night Curlew.

Decreasing annually as a breeding species. Individuals are obtained on passage in autumn and again in March. In 1886 a specimen was obtained at Rainham as late as 23 Decem-

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ber (Prentis). This plover, locally called 'thick-knee,' used to breed in tolerable numbers on the Lydd beach and in its neighbourhood, but now it is rare to find more than one or two pairs breeding there. This banishment has been mainly brought about by the disturbing influence caused by the artillery practice at Lydd, and in a lesser degree by the modern practice of rolling young wheat. On 22 May 1896 I found a nest on the Lydd beach containing two eggs, but owing to the locality being continually subjected to a 'dropping' artillery fire the birds deserted the nest after four days of sitting. It has probably bred near Rainham, since Mr. Prentis mentions having procured a bird in June.

194. Cream-coloured Courser. *Cursorius gallicus* (J. F. Gmelin)

A rare wanderer. In the British Museum there is a specimen obtained by Mr. William Hammond in 1785 near Wingham (Latham, *Gen. Syn. Suppl.* 1787, p. 254, pl. 116). On 10 October 1866 another was killed near Sandwich and is now in the Margate Museum (Harting, *Zool.* 1866, p. 523).

195. Dotterel. *Eudromias morinellus* (Linn.)

A scarce migrant in spring and autumn. A fine pair of this species were obtained near Lydd on 29 May 1896, and are in my collection. In September immature birds on passage now and again frequent the grass land near our chalk range between Great Chart and Wye.

196. Ringed Plover. *Ægialitis biaticula* (Linn.)

Locally, Stone-runner.

A common resident along our coast where there are stretches of sand and mud. Considerable numbers breed on the Lydd beach, where I have taken the eggs. During the breeding season these noisy little birds course over the beach all day long, uttering their whistling cries. Even the skylarks of the locality catch their plaintive notes, and produce them amongst their own with startling exactitude. In September the homebred birds are augmented by numbers of migrants, resorting to the shore line in large flocks. In spring the continental form of this species—a smaller bird—may often be met with on the south coast.

197. Kentish Plover. *Ægialitis cantiana* (Latham)

Locally, Stone-runner.

As a breeding species becoming scarcer

every year. The breeding locality of this bird is the Lydd beach between Rye and Dungeness, and the artillery practice at Lydd during the nesting season as well as the greed of collectors are effectually bringing about the banishment of this species. In 1896 four pairs bred on the beach not very far from Dungeness. The nest is not easily found. The bird seldom makes any demonstration in the way of a call-note; it creeps away like a mouse through the dry beach grass, which it resembles so closely in colour. When the eggs are hatched the bird is still more wary. It often drops the food close to the young without even alighting. In the beginning of September the birds, bred in the locality, assemble in small flocks of five to six birds, frequent the water's edge at low tide for a short time, and then depart.

198. Golden Plover. *Charadrius pluvialis*, Linn.

Common during severe winters; the majority are immature birds frequenting our grass fields. During the autumn migration in September small parties visit for a short time the vicinity of our harbours. In spring they seldom stop, passing high over head in small flocks, chiefly adults with their black breasts.

199. Grey Plover. *Squatarola belvetica* (Linn.)

Throughout September small parties of immature birds appear from time to time on the portions of our coast where the sand is muddy and along the brackish pieces of water on the Lydd beach. In November the adult birds put in an appearance, but only a few remain with us throughout the winter. From May to the beginning of June individuals in breeding plumage come and go on our mud-flats. I have known a few birds stay with us throughout the summer.

200. Lapwing. *Vanellus vulgaris*, Bechstein. *Locally*, Peewit, Green Plover.

A common resident, breeding in the marshes, but owing to drainage and the modern practice of rolling young wheat its breeding numbers have decreased. During severe winters numbers of 'foreigners' come to our pasture fields. In the beginning of September large flocks congregate on our south coast prior to leaving the county.

201. Turnstone. *Streptilas interpres* (Linn.)

A common migrant to our coast in spring and autumn; birds in summer dress are seldom obtained.

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202. Oyster-catcher. *Hæmatopus ostralegus*, Linn.

Locally, Olive.

The sandy portions of the Rye coast, Whitstable and Sandwich attract now and again small parties of oyster-catchers. They are more numerous on the autumn than on the spring migration. This bird has bred on the beach not far from Dungeness. I had this information from Mr. Southerden of Jury's Gap, Lydd, who is a reliable authority.

203. Avocet. *Recurvirostra avocetta*, Linn.

Locally, Cobbler's Awl.

This bird used to nest on the flat shore line near Lydd, but now it is only a rare visitor in spring and autumn. Marwick, writing in 1795, says: 'I found in the marshes near Rye a young one of this species, which appeared to have been just hatched, and I took it up in my hand, whilst the old birds kept flying round me.' The record for Kent of this rare visitor is as follows: one, Romney Marsh, April 1849 (*Zool.* 1849, p. 2455); one, Sandwich, 22 April 1849; two, marshes between Ramsgate and Sandwich, March 1849 (*Zool.* 1849, p. 2455); one, River Medway, Rainham, 23 September 1887 (Prentis); one, Lydd, 28 April 1889, in Mr. Southerden's house, Jury's Gap, Lydd; one, near North Foreland, August 1895. (The last was brought to Mr. Oxenden Hammond, and at time of being shot was in company with three others (*Zool.* 1895, p. 349). In my own collection I have an adult female from the Lydd beach, 23 May 1898, and another female from the same locality, 17 May 1897.

204. Black-winged Stilt. *Himantopus candidus*, Bonnaterre.

Very rare. Some few years ago a specimen was obtained at Faversham and is now in the Canterbury Museum.

205. Grey Phalarope. *Phalaropus fulicarius* (Linn.)

An annual visitor in autumn, the visitations some years being considerable. In the great immigration from August to October in 1866 numbers occurred on the south coast between Rye and Dungeness. These birds generally come to our brackish pools after bad weather in September. In September 1896, after stormy weather with south-westerly winds, I obtained several about the pools on the Lydd beach.

206. Red-necked Phalarope. *Phalaropus hyperboreus* (Linn.)

A rare visitor in autumn, generally after

rough weather. It has occurred at Dover (1861, Dover Museum); at Rainham, 28 September 1871 (*Zool.* 1871, p. 2847), and near Lydd, where I obtained an adult female in a small reed-girt pond near the shore on 20 September 1899, after rough weather with south-westerly winds.

207. Woodcock. *Scolopax rusticola*, Linn.

Breeds sparingly in the county, and more frequently of late years owing to the increase of plantations. In the Cranbrook district it nests in the Bedgebury woods, about Sissinghurst and near Frittenden. Its breeding area in Kent is restricted to the Weald.

208. Great Snipe. *Gallinago major* (J. F. Gmelin)

A rare migrant in autumn. In the collection of Mr. Oxenden Hammond there is a specimen shot near Deal, 1 October 1894.

209. Common Snipe. *Gallinago cælestis* (Frenzel)

Locally, Full Snipe.

Best known as a winter visitor. At the end of July a few birds appear, but these are only stragglers, the species not becoming common till the beginning of October. On 24 April 1897 Mr. N. F. Ticehurst of St. Leonards found it breeding in Romney Marsh (*Zool.* 1897, p. 271) This is the first recorded instance of this species nesting in the county.

The so-called Sabine's snipe, a dark variety of the present species, has occurred in the county (Dowker).

210. Jack Snipe. *Gallinago gallinula* (Linn.)

A winter visitor, but much less common than the preceding species, and of local distribution, preferring sheltered brooks rather than open marsh land. It is often to be found in company with the common snipe.

211. Broad-billed Sandpiper. *Limicola platyrhyncha* (Temminck)

A very rare autumn migrant. Two instances have occurred in Kent. On 6 September 1896 an immature female was killed out of a flock of dunlin at Littlestone. It is now in my collection. The second specimen, also an immature female, was obtained at the same place on 31 August 1901 (Curtis Edwards, *Zool.* 1901, p. 390).

212. Pectoral Sandpiper. *Tringa maculata*, Vieillot.

This species has only lately been added to the Kentish list. An adult male was shot

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out of a flock of dunlin along the sea shore between Lydd and Rye Harbour on 2 August 1898. It is the property of Mr. Whiteman, of Rye, who kindly showed me the bird. This instance has been recorded by Mr. N. F. Ticehurst (*Zool.* 1898, p. 480).

213. Dunlin. *Tringa alpina*, Linn.

Locally, Ox-bird.

Common, its numbers being augmented by large flocks or 'flings' in autumn and spring, especially in the former season. There are two races of dunlin, a small and a large one, the latter being the North American form. The plumage of the small race is altogether darker, while the markings on breast and flanks are brighter and more condensed. I have observed that this small race is much later than the majority of duns in arriving on the coast during autumn, and fonder of obtaining food near brackish water and on oozy flats than on the shore line. The following are the measurements of the two forms which I have obtained on the south coast: Length 8.75 in., culmen 1.45 in., wing 4.5 in., weight 2 oz. (large race); length 7 in., culmen 1.1 in., wing 4.4 in., weight 1½ oz. (small race). Very few adult birds remain with us through the entire summer, although I have observed them in summer plumage on the south coast as late as 3 June. A certain number of immature birds with a strong rufous tinge in their plumage remain with us throughout the year. This plumage is that of the second year, before the black breast is assumed.

214. Little Stint. *Tringa minuta*, Leisler.

By no means common. Occasionally met with in autumn in September and October, but rare on the passage northward in spring. I have a pair in perfect summer plumage shot near Rye Harbour in April 1890. Several have been obtained on the Medway in September (Prentis). It often consorts with the dunlin.

215. Temminck's Stint. *Tringa temmincki*, Leisler.

An irregular autumn and spring migrant, occurring much less frequently than the last named species. It has been obtained at Deal 6 September 1850 (*Zool.* 1850, p. 2923), at Rainham and Isle of Sheppey (Prentis), and near Lydd, where I obtained a specimen in August 1899. I have no record during spring for Kent, although I have an adult female, shot on the Pevensy levels near Rye on 9 May 1896 (*Zool.* 1896, p. 247).

216. Curlew-Sandpiper. *Tringa subarquata* (Güldenstädt)

A scarce migrant in spring and autumn, some years more plentiful than in others. I have found single individuals after the equinoctial gales in September on the south coast. Adult birds in breeding dress are rare. I have a specimen obtained near Rye in perfect summer plumage, and another in a transitional state. On the north coast it is seen at the beginning of September along the creeks of the Medway.

217. Purple Sandpiper. *Tringa striata*, Linn.

Scarce. I have never met with it on the Lydd coast, though I have obtained it on the rocky portions of the shore line between Rye and St. Leonards. We have no rocky shore suitable to this species. In severe winters it has been obtained about the marsh walls near Rainham (Prentis).

218. Knot. *Tringa canutus*, Linn.

Small parties of immature birds arrive in August, the adults coming in October, visiting our mud-flats and estuaries, where during winter considerable flocks may be seen. I have observed single individuals on the Lydd beach as late as 13 June.

219. Sanderling. *Calidris arenaria* (Linn.)

During August the sanderling, next to the dunlin, is the most numerous shore-bird on the sandy portions of our coast. By the end of September the migration southward has been resumed. A few remain during the winter and I have obtained specimens in November. This species on the spring migration is much less common. During my stay near Rye in 1896 the first flock in summer dress appeared on 29 May, the last being seen on 2 June.

220. Ruff. *Machetes pugnax* (Linn.)

Formerly a resident, now only an irregular migrant in autumn, when small parties, generally immature birds, pass us during August on their way south. There are two fine adult males and a female in breeding plumage in the Plomley collection, Dover Museum, obtained many years ago from Lydd. There is not a doubt that in the 'forties' this species bred in Romney Marsh, but now the course of drainage and its attendant results have banished it.

221. Common Sandpiper. *Totanus hypoleucus* (Linn.)

Locally, Summer Snipe.

A migrant in spring and autumn, more numerous during the latter season. In April

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I have observed individuals along the dykes of our marsh land and running streams in the Weald. I have searched in vain for the nest of this species in many portions of Kent and have carefully watched the birds, but they never remained for any length of time in one locality. In 1896, near Rye, I flushed a pair along one of the marshland dykes as late as 30 May. I was in hopes of finding a nest, but the birds disappeared a few days later.

222. Wood-Sandpiper. *Totanus glareola* (J. F. Gmelin)

This species, locally known as 'autumn snipe,' is of very irregular occurrence, and during the autumn one or two stragglers are the most that appear along the dykes of our marsh land. Its migration seems to touch our coast but slightly, and then the bird resorts to sheltered ditches whose banks are bordered with mud and rushes in preference to the exposed shore line.

223. Green Sandpiper. *Totanus ochropus* (Linn.)

From the middle of July to the beginning of October small parties of this species come and go in the vicinity of our marsh land; yet individuals may be observed at practically all seasons of the year about our ponds in the county. These birds on migration fly at a considerable altitude, pitching almost vertically down to their feeding grounds, where towards sunset they become very noisy with their sharp 'wheet-wheet, wheet-wheet' cries. Sheltered ditches are favourite resorts. There is no positive evidence of this bird breeding in the county, although in 1860 a pair remained about the Rainham marshes throughout the summer (Prentis, *Birds of Rainham*, p. 60). I have never observed this species in the county in spring. In the Maidstone Museum are three specimens obtained at Linton.

224. Redshank. *Totanus calidris* (Linn.)

Locally, Red-leg, Tooke.

A well distinguished resident outside the Weald, resorting to our marsh land to breed and then to the mud-flats in autumn. Owing to drainage and cultivation its numbers have considerably diminished of late years, and it is also persecuted by the country people, who take the eggs for eating. The principal breeding localities are Romney Marsh and the Lydd beach. In the north of the county it is less plentiful, but breeds in the Rainham and Stour marshes: on the low-lying ground about the Medway between Chatham and Sheerness, and in the Wingham marshes. It

has even nested in Chatham Dockyard (*Zool.* 1886, p. 332). Redshanks pair about the middle of April, and at this time are constantly on the move uttering their wild and pleasing cries throughout the day and also at night. About the end of July they begin to flock and are then difficult to approach; they leave towards the end of September.

225. Spotted Redshank. *Totanus fuscus* (Linn.)

A scarce autumn migrant. It has been obtained on the Medway 20 October 1882 (Prentis); on the river Stour (9 September *Zool.* 1889, p. 435, Dowker); and at Dover and Lydd (Plomley collection). Lastly, I have a pair of fine adult birds, killed near Lydd on 12 September 1899.

226. Greenshank. *Totanus canescens* (J. F. Gmelin)

Towards the end of August small parties of immature birds put in an appearance on our north and south coasts, but on the spring migration it is seldom met with.

227. Bar-tailed Godwit. *Limosa lapponica* (Linn.)

Locally, Petsel.

A common migrant in spring and autumn to the mud-flats and sandy portions of our shore line, being seldom observed in spring on the north coast. Adults in the red breeding plumage are scarce. Throughout May small parties break their passage on the south coast, but nearly all these are still in their winter dress. In the beginning of September flocks of immature birds, numbering sometimes over thirty, appear on the mud-flats and marsh land near the coast, and are very often to be found in company with curlews.

228. Black-Tailed Godwit. *Limosa belgica* (J. F. Gmelin)

A scarce migrant in spring and autumn, occasionally in winter. In January 1881 several immature birds were seen on the Medway and one was shot. On 20 October 1882 another was obtained (Prentis). On 21 August 1896 an immature bird was shot on the Lydd beach, and two more (a pair) on 20 September (*Zool.* 1896, pp. 411, 413). These specimens are in my collection.

229. Common Curlew. *Numenius arquata* (Linn.)

Towards the end of August the curlew comes to the mud-flats on our north coast and to the Lydd beach on the south. In the latter locality I have seen flocks numbering over 200 birds. In the early morning these flocks repair to the neighbouring grass fields

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to obtain food, and this field diet is varied during the day by that of the sea shore. Towards sundown these birds are clamorous in the extreme. They utter incessantly their 'courlie' cries, and these are further varied by pretty rippling ones. A flock in the far distance will rise up and fly past another at rest. This movement calls forth vociferous cries from the latter, who seem clearly to be asking them to stop and join their community, for the curlew loves company and is seldom seen alone at this time of the year. In this way they pass their time, waiting anxiously for the tide to lay bare the sands. From time to time messengers are sent out over the seawall to ascertain whether the sands are yet in view and their return is always welcomed with a great demonstration. Should the night be inclement they leave the exposed situation of the Lydd beach and retire inland to rest, seeking sheltered spots in Romney Marsh. By the end of September the majority have left; only a few remain, frequenting the sands at low tide. When first they arrive near the coast they keep much to the pasture fields and seldom visit the shore line. A few remain throughout the winter. I have an adult, obtained in December from the Cranbrook district. It has been observed at Rainham throughout the summer (Prentis). On the Rainham marshes trained dogs are often employed by the fishermen and 'mud-diggers' to assist them in killing the small flocks of young birds on their arrival in August. A dog is sent out on the mud-flats, and as soon as the curlews see it they invariably attack it. The dog then retreats to the dyke where his master lies hidden, and the curlews, following up their success, soon fall victims to the ensconced gunner.

230. Whimbrel. *Numenius phaeopus* (Linn.)

Met with in spring and autumn—in May and again in September, but less frequently in the latter season. Their passage northward in spring is marked with extreme regularity every year. Mr. Prentis says: 'The 7th of May is the grand time for the whimbrels; after staying a week or ten days they are all off together, not a single one being left behind. In the autumn they make no stay, flying high overhead we hear their clear whistle.' A few birds sometimes remain with us throughout the winter, especially on the south coast.

231. Black Tern. *Hydrochelidon nigra* (Linn.)

Locally, Black Kip.

There is hardly any doubt that this tern bred in Romney Marsh before drainage and

cultivation was commenced. Now it is only a spring and autumn migrant, less common during the former season. In August and September I have met with small batches on migration, all immature birds, on the shore near Lydd. On 24 May 1896 I observed an adult pair following the sea-board near Rye. Storm-driven individuals sometimes occur far inland. An immature female, obtained at Marden, is in the Maidstone Museum.

232. Gull-billed Tern. *Sterna anglica*, Montagu.

A rare spring visitor. There are two specimens from Lydd in the Plomley collection.

233. Caspian Tern. *Sterna caspia*, Pallas.

Like the last, a rare visitant. One was obtained near Lydd prior to 1845 (Thompson, *Notebook of a Naturalist*, p. 265). Some few years ago an individual was observed on the Medway in autumn by Mr. Prentis.

234. Sandwich Tern. *Sterna cantiaca*, J. F. Gmelin.

A resident, though very locally distributed. I have found its nest in the county, but for obvious reasons I shall not mention the locality. This species was first discovered to be a British bird by Mr. Boys, who found it at Sandwich in 1784.

235. Common Tern. *Sterna fluviatilis*, Naumann.

Locally, Kip.

A resident, but locally distributed in its breeding haunts. The colonies on the Lydd beach have sadly diminished within the last few years. The restricted breeding area taken up by these terns is distinctly prejudicial to the safety of their eggs. The children of the fishermen and coastguard officers soon discover these spots, and the eggs are taken for eating. The increased artillery practice over the Lydd beach has also a great deal to answer for in the diminution of this tern's breeding numbers.

236. Arctic Tern. *Sterna macrura*, Naumann.

Immature birds have occasionally been obtained off the south coast in autumn, on their migration south.

237. Little Tern. *Sterna minuta*, Linn.

Locally, Scurrit.

A summer visitor. Breeds in small colonies on the Lydd beach, where it is more numerous than the common tern. All day long these little terns may be seen wending their flight

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over the beach, twittering all the time like so many restless swallows. Both species of these terns keep separate in their breeding haunts, the lesser tern preferring rather the close proximity of the sea. They come early in May, the majority leaving towards the middle of September. At Rye I have observed them as late as 4 October. In August the home-bred birds are augmented by others from further north.

238. Sabine's Gull. *Xema sabinii* (Joseph Sabine)

Very rare. A fine adult male was obtained near Rye on 2 October 1891. It was preserved by Mr. Catt of Iden, and is now in my collection.

239. Little Gull. *Larus minutus*, Pallas.

Decidedly uncommon, occurring in winter and spring. I have the following records: one adult, near Gravesend, 6 October 1868 (*Zool.* 1868, p. 1462); one (in second year's plumage), Rainham, 7 February 1870; one adult, 14 February 1874, Milton Creek near Rainham; one immature, 17 September 1884, Rainham; one adult male, 12 March 1898, Horsemonden; one adult female (mottled head), 17 October 1898, Broomhill, Lydd. The last two are in my collection, while in the collection of Mr. Oxenden Hammond there are several specimens besides those enumerated.

240. Black-headed Gull. *Larus ridibundus*, Linn.

Locally, Crocker.

A resident, but not so numerous as formerly. There is a breeding colony of these birds at the Hoppen Petts, Lydd. These 'petts,' which lie about four miles south-east of Lydd, consist of two large pieces of water of unknown depth, fringed with treacherous reed-beds. On 4 June 1896 I found over twenty nests there, all containing eggs with the exception of two, which had young. These nests were invariably placed close to the edge of the reed-beds nearest the water. On one small 'reedy' promontory there were no fewer than eight, situated hardly a yard apart.

These birds leave this place every autumn with marked regularity. There is a saying that the 'crocker,' as this gull is locally called, leaves the Hoppen Petts on Romney Fair day, which falls on 21 August. During the remainder of the year they frequent the seaboard in large parties. In rough weather they go sometimes far inland, visiting the freshly-turned furrows and following the

plough to pick up the earthworms. This gull is common on the Medway from autumn to early spring (Prentis). In the north of the county these gulls leave for their breeding haunts about the end of February, the majority returning in the beginning of August, when they resort throughout the winter to the creeks, occasionally visiting the 'sprat' fields.

241. Common Gull. *Larus canus*, Linn.

Locally, Cob.

Not common. Generally seen on the flat portions of our shore line during the autumn migration. It has been obtained at Cranbrook.

242. Herring-Gull. *Larus argentatus*, J. F. Gmelin.

Adult birds are numerous from September to early spring on the sandy stretches of our shore line between Rye and Dungeness. A certain number of immature birds remain with us throughout the year. There is a large colony of herring-gulls on the Dover cliffs.

243. Lesser Black-backed Gull. *Larus fuscus*, Linn.

Locally, Parson Mew.

Adults are scarce, though occasionally met with in autumn and spring along the sandy stretches. Immature birds are fairly common.

244. Great Black-backed Gull. *Larus marinus*, Linn.

Locally, Parson Mew.

Adults are more numerous than those of the last named species, being observed in September and again in March; but the majority keep out at sea, following in the wake of trawlers in expectation of seizing the small fry that is thrown overboard. Immature birds are numerous throughout the year.

245. Kittiwake. *Rissa tridactyla* (Linn.)

Locally, Sprat Mew.

Occasionally met with from autumn to spring near our estuaries and harbours. After stormy weather individuals have been taken far inland.

246. Great Skua. *Megalestris catarrhactes* (Linn.)

A rare straggler. On 4 October 1900 an adult female was killed at sea off Dungeness and examined in the flesh by Mr. Ruskin Butterfield of St. Leonards (*Zool.* 1900, p. 521).

247. Pomatorhine Skua. *Stercorarius pomatorhinus* (Temminck)

Occurs more frequently than preceding

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species. On 20 February 1882 an adult and an immature bird were killed near Rochester. There are two specimens in the Plomley collection from Lydd, and an adult female killed on 12 December 1898 at Broomhill farm, Lydd, is now in my collection.

248. Arctic or Richardson's Skua. *Stercorarius crepidatus* (J. F. Gmelin)

A regular migrant along our coast in autumn. It is generally observed at sea, whenever the fishing smacks are out. It often attacks the gulls and common terns in order to rob them of their prey. I have seen handsome specimens varying from a dark chocolate to a pale brown.

249. Long-tailed or Buffon's Skua. *Stercorarius parasiticus* (Linn.)

Next to the great skua this is the rarest of the skuas that visits our coast line. There are two specimens, locally taken, in the Dover Museum.

250. Razorbill. *Alca torda*, Linn.

Found off the coast, and after severe gales it is now and again blown inland. In the winter of 1893 a specimen was picked up in a hop garden at Hartley near Cranbrook. It has been obtained in the Thames at Sheerness (Maidstone Museum).

251. Guillemot. *Uria troile* (Linn.)

Locally, Willock, Willy.

Has bred on the inaccessible portions of the cliffs between St. Margaret's Bay and Dover. In October it is found in large parties at sea off Rye, following the fishing smacks.

252. Little Auk. *Mergulus alle* (Linn.)

An uncommon winter visitor. It has been obtained after severe storms far inland: one example at Dover, November 1870 (Gordon); one at Boxley (Maidstone Museum); one at Goudhurst (near Cranbrook), male, 7 January 1895; one at Sissinghurst, picked up exhausted, 20 November 1900.

253. Puffin. *Fratercula arctica* (Linn.)

I have seen this species off the Rye coast in September. Mr. Prentis writes: 'A storm-driven puffin was picked up dead on our marsh after the November gale of 1893.'

254. Great Northern Diver. *Colymbus glacialis*, Linn.

Locally, Herring-bar.

I have had no acquaintance with this bird. Mr. Prentis writes: 'Young, immature great northern divers are sometimes met with and

shot on the Medway.' It is met with off Whitstable and in the river Stour (Dowker). In the Maidstone Museum there is a fine example, obtained at Boxley by Major Best.

255. Black-throated Diver. *Colymbus arcticus*, Linn.

Locally, Herring-bar.

Rare. Immature birds are sometimes met with. On 11 February 1871 an adult female was obtained at Folkestone (Charles Gordon).

256. Red-throated Diver. *Colymbus septentrionalis*, Linn.

Locally, Spratt Loon, Herring-bar.

Common about our estuaries in winter and spring. Examples with red throats are seldom obtained.

257. Great Crested Grebe. *Podiceps cristatus* (Linn.)

An uncommon migrant, making its appearance sometimes in winter about our creeks and rivers. They are nearly always immature birds. On 24 September 1899 an adult was shot at Littlestone and preserved by Mr. Bristow of St. Leonards.

258. Red-necked Grebe. *Podiceps griseigena* (Boddaert)

A rare winter migrant. I have an adult in winter plumage, obtained on the lake at Bedgebury, Cranbrook, on 31 December 1895.

259. Slavonian Grebe. *Podiceps auritus* (Linn.)

A winter visitor. I have seen specimens obtained near Lydd by the Southerden brothers.

260. Eared Grebe. *Podiceps nigricollis* (Brehm.)

A rare visitor. The recorded occurrences are all immature birds; two at Rainham, September 1881 (Prentis); one at Stourmouth, February 1875 (Dowker).

261. Little Grebe or Dabchick. *Podiceps furviatilis* (Tunstall)

Locally, Spider Diver or Dab-chick.

A resident, breeding in our marsh ditches and ponds, but of late years its numbers have decidedly decreased owing to increased drainage and the droughts of the last few summers.

262. Storm-Petrel. *Procellaria pelagica*, Linn.

Locally, Storm Finch.

During stormy weather in autumn and winter this bird is occasionally driven inland.

BIRDS

263. Leach's Fork-tailed Petrel. *Oceanodroma leucorhoa* (Vieillot)

My remark on the preceding species also applies to this petrel. It has occurred as far inland as Maidstone, where an adult female was captured, and is now in the museum of that town.

264. Maderian Fork-tailed Petrel. *Oceanodroma castro* (Harcourt)

The first recorded example of this rare wanderer to the British Isles was picked up on the beach close to Littleston near Dungeness on 5 December 1895, at a time when strong north-westerly gales were prevalent. It was sent to Mr. Bristow, the taxidermist of St. Leonards, where I examined the bird in the flesh. It is now in my collection. This petrel is very similar to Leach's fork-tailed petrel, but differs in the following respects: tail, nearly square and not deeply forked; basal part of outer feathers white, not dark to the base; upper tail coverts white, tipped

with black and not uniform white. For a description of this bird's breeding haunts and habits see my paper in *Ibis*, 1897, pp. 96-7; also *Zoologist*, 1896, p. 167.

265. Great Shearwater. *Puffinus gravis* (O'Reilly)

An individual of this rare species was taken alive on the rocks at Ramsgate 29 October 1890 (J. H. Gurney, *Zool.* 1891, p. 274).

266. Manx Shearwater. *Puffinus anglorum* (Temminck)

A migrant to the Kentish coast. A specimen in the Folkestone Museum was taken at Dover.

267. Fulmar. *Fulmarus glacialis* (Linn.)

A rare wanderer so far south as Kent. The only example on record was obtained at Wittersham 17 October 1894. It was sent to Mr. Springett of Cranbrook, where I saw it in the flesh, and it is now in my collection.

ADDENDA

The Collared Pratincole. *Glareola pratincola* (Linn.)

On 30 May 1903, at Jury's Gap in Romney Marsh, a male specimen of the collared pratincole was shot by Mr. Southerden on a pool of water near his house. It allowed of an easy approach, the bird flying round the water in short circles and alighting again almost immediately. It was examined in the flesh by Dr. Ticehurst of St. Leonard's, and subsequently exhibited by him at a meeting of the British Ornithologists' Club (Bull. *B.O.C.* No. xcix. vol. xiii. p. 77). This specimen, the first recorded for Kent, is now in the collection of Mr. Fleetwood Ashburnham, of Broomham Park, Sussex. The collared pratincole can only be regarded as a rare wanderer in spring and autumn to Great Britain and a summer visitor to the south of Europe, ranging as far east as Turkestan and the Indian Peninsula. It winters in Africa, returning in April to the northern portions, where considerable numbers remain to breed. Along the African rivers, small parties haunt the rocky portions, from which it is difficult to drive them away, taking, on being disturbed, a short circuitous flight only to return again to their favourite island of rocks in mid-stream.

The Black-winged Pratincole. *Glareola melanoptera*, Nordm.

At the beginning of June 1903 a male of this species was obtained near Littlestone by Mr. F. Mills. This was exhibited by Dr. Ticehurst at a meeting of the British Ornithologists' Club, and stands as the first recorded instance from the British Isles. Subsequently, on 17 June, another male was shot by a man named Jones in Romney Marsh. This second specimen is now in the collection of Mr. Fleetwood Ashburnham. Besides the occurrence of these two males in Romney Marsh, a female specimen was obtained near Rye Harbour on 18 July 1903. There is not a doubt that all these pratincoles formed part of the same visitation to Romney Marsh. The black-winged pratincole also winters in Africa, and is the representative form of the collared pratincole in south-eastern Europe. It differs from the latter in having black underwing coverts instead of chestnut, and in having no white alar bar.

MAMMALS

From the marsh-land and rivers, the open country and thickly wooded vales of Kent is recorded nearly every recognized species of British mammal. The wild cat (*Felis catus*) has been extinct in this county for many years, and although there is no doubt that it existed here at one period, there seems to be no records of its appearance that can be relied upon except that of its fossilized remains found at Ightham.¹ There are old keepers who assert that they have themselves caught it in years gone by, which is very likely to be true, but their assertions cannot be accepted as records. The pine marten (*Mustela martes*) is another extinct species which certainly existed in considerable numbers about 100 years ago, and there are many reputed instances of its occurrence about 40 years ago, but they are unauthenticated. The polecat (*Putorius putorius*) is probably now extinct, but it existed a few years ago. The badger (*Meles meles*) is rarely met with, but it still exists and is preserved in one or two places in the county. The pigmy shrew (*Sorex minutus*) and the harvest mouse (*Mus minutus*) appear to be decreasing in numbers. A variety of the weasel (*Putorius nivalis*) is found in Kent, which differs from the typical animal in its marking, size and habits; it is interesting to note that Gilbert White draws attention to it in his *Natural History of Selborne*.²

The Thames and Medway³ are occasionally visited by the common seal (*Phoca vitulina*), and the dolphin (*Delphinus delphis*). A specimen of Rudolphi's porpoise (*Balaenoptera borealis*) was taken from the Thames at Tilbury on 19 October 1887, which measured 35 ft. 4 in.⁴ and another measuring 32 ft. 2 in. was caught at Gillingham on 30 August 1888 and described by Mr. Walter Crouch in the *Rochester Naturalist*.

Other records of Cetaceans will be found in Dr. J. Murie's *Report on the Kent and Essex Fisheries*, published in 1903. Information concerning specimens preserved in the British Museum has been supplied by Mr. Boulenger.

CHEIROPTERA⁵

1. Greater Horse-shoe Bat. *Rhinolophus ferrum-equinum*, Schreber.

Occasionally seen in the county, frequenting some of the old buildings such as Rochester Castle and Chalk Church.

2. Lesser Horse-shoe Bat. *Rhinolophus hipposiderus*, Bechstein.

Recorded from Canterbury Cathedral. There is a specimen in the Maidstone Museum presented by H. Lamb, marked 'Maidstone, 1892.'

¹ Lydekker, *British Mammals*.

² Fielding, *Memories of Malling*.

³ Letter XV. Selborne, March 30, 1768.

⁴ *Proc. Zool. Soc.* 1887, 567.

⁵ Flittermice is the local term applied to all bats.

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3. Long-eared Bat. *Plecotus auritus*, Linn.

Common throughout the county.

4. Barbastelle. *Barbastella barbastellus*, Schreber.

Bell—*Barbastellus daubentonii*.

This bat was first discovered in our islands at Dartford in Kent, and subsequently taken in a chalk cave at Chislehurst.¹ There is a specimen in Maidstone Museum from Allington, presented by H. G. T. Drake, dated September 1898, and another Kentish specimen preserved in spirit.

5. Serotine. *Vespertilio serotinus*, Schreber.

Bell—*Scotophilus serotinus*.

Several times reported. Taken at Folkestone (Lydekker), and Mr. H. Elgar, assistant curator of Maidstone Museum, informs the writer that it is plentiful at Yalding. It is often mistaken for the noctule, and is probably more common than is supposed.

6. Great or White's Bat (Noctule). *Pipistrellus*, Schreber.

Bell—*Scotophilus noctula*.

White—*Vespertilio altivolans*.

Seen frequently in the county. Mr. George Dowker² records that at Stourmouth (near Canterbury) in April 1884 several of these bats were turned out from the rotten branch of a walnut tree, where they had been hibernating. All were males, and each measured 14 in. in the expanse of its wings. They were captured alive and kept in a cage, but soon after died, for they all refused food. A

large number of these hibernate each winter in Mr. Dowker's house (at Stourbridge), emerging from their winter courses about the middle of May. He counted fifty-six noctules emerging from winter quarters on 17 May, 1889, at 8 o'clock in the morning. On the following evening about forty were counted. Three of these were shot, and proved to be females, and their expanded wings each measured 14 in.

7. Pipistrelle or Common Bat. *Pipistrellus pipistrellus*, Schreber.

Bell—*Scotophilus pipistrellus*.

This small bat is very common.

8. Natterer's Bat. *Myotis nattereri*, Kuhl.

Bell—*Vespertilio nattereri*.

Bell recorded this from Kent, and Mr. Dowker says it has been taken from Chislehurst and Tonbridge. There is a very old specimen from Simmons in Maidstone Museum.

9. Daubenton's Bat. *Myotis daubentonii*, Leisler.

Bell—*Vespertilio daubentonii*.

Mr. Dowker mentions³ that it has been recorded from Dover.

10. Whiskered Bat. *Myotis mystacinus*, Leisler.

Bell—*Vespertilio mystacinus*.

Recorded by Bell from Chislehurst. It is possible that it is often mistaken for the pipistrelle.

INSECTIVORA

11. Hedgehog. *Erinaceus europæus*, Linn.

This animal is very common throughout the county. There is no doubt that it is an egg stealer, for it can be caught with an egg as a bait. It has the peculiar habit of taking one or two eggs each night from a nest, sometimes from under the hen, unlike most other robbers, which destroy a whole clutch at a time. These destructive habits make it an enemy to the gamekeeper; but the good it does on the land as an insect eater goes far to outweigh them.

12. Mole. *Talpa europæa*, Linn.

Common in woods and field alike. Undoubtedly these animals do an incalculable amount of good by destroying injurious ground pests such as the wireworm. If mole

heaps are seen in a field, there is evidence that the destructive larvæ are abundant.

13. Common Shrew. *Sorex araneus*, Linn.

Very common.

14. Pigmy Shrew. *Sorex minutus*, Pallas.

Bell—*Sorex pygmaeus*.

This tiny mammal is getting rare. It very often escapes notice, but it has been seen in the leaves under the hornbeam trees on the Cobham Hall estate. Its gradual extinction may perhaps be accounted for by the preservation of the owl, which is now generally free from persecution.

15. Water Shrew. *Neomys fodiens*, Pallas.

Bell—*Crossopus fodiens*.

Distributed through the county, but does not seem to be abundant. There are two specimens in the Maidstone Museum.

¹ Lydekker, *British Mammals*, 1895.

² *South-Eastern Naturalist*, i. 1891.

³ *Ibid.*

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CARNIVORA

16. Wild Cat. *Felis catus*, Linn.

There do not appear to be any authenticated records of the wild cat for many years, although it is reported to have been captured in the thick woods at Chattenden and elsewhere in the county. Robert Pocock¹ wrote in 1809 that the cat was 'uncommon and seldom seen,' presumably referring to the wild cat.

17. Fox. *Vulpes vulpes*, Linn.

Bell—*Vulpes vulgaris*.

Found in almost all wooded districts. Vixens have been taken from earths with four to ten cubs. They are nearly always to be found in the earth with their cubs until these are five weeks old. A litter of very young cubs was once found in a characteristic form in some brambles on the Cobham Hall estate, where they no doubt had been born owing to the earths having been ferretted and stopped just previously. The vixen was seen to leave the spot when beaters approached.

18. Pine Marten. *Mustela martes*, Linn.

Bell—*Martes abietum*.

Robert Pocock² wrote in 1809 that martens were 'uncommon and seldom seen.' There are many reputed instances of it having occurred forty to sixty years ago, but in most cases the source is not reliable.

19. Polecat. *Putorius putorius*, Linn.

Bell—*Mustela putorius*.

Fielding, in *Memories of Malling*, writes: 'Once plentiful, but now only occasionally seen in the county.' It certainly existed thirty to forty years ago, but is now probably extinct. Vulgar, the gamekeeper at Chattenden, possibly caught the last in the early seventies.

20. Common Stoat. *Putorius ermineus*, Linn.

Bell—*Mustela erminea*.

Common wherever rabbits abound. The variation in colour which often occurs in late autumn and winter is the best example among Kentish quadrupeds of adaptation of colour to environment.

21. Weasel. *Putorius nivalis*, Linn.

Bell—*Mustela vulgaris*.

Locally, Keen (a small variety).

Common. This animal lives chiefly on mice, but also on voles, small rats and rabbits, and small birds when it can catch them.

¹ G. M. Arnold: *Robert Pocock, the Gravesend Historian*.

² Ibid.

Unfortunately, it is very fond of young pheasants and partridges, which it catches and drags one at a time into a hole. It often makes use of mole runs, and is occasionally caught in mole traps. One was caught with its coat turned white along the back, at Shorne, about February 1881.

Gilbert White, in his *Natural History of Selborne*³ wrote: 'Some intelligent country people have a notion that we have in these parts a species of the genus *Mustelinum*, besides the weasel, stoat, ferret and polecat; a little reddish beast not much bigger than a field mouse, but much longer, which they call a "cane."' Zoologists only admit of one species, but the variety alluded to by White certainly exists, or did formerly, in Kent. The typical weasel is about 7 to 8½ in. in length (without the tail), and frequents woods, fields and hedges. The 'keen' is only 6 in. (without the tail), is much thinner, and more spotted around the throat than the typical species. It was well known by all the old gamekeepers in the woods of the Cobham Hall estate, where between twenty and thirty years ago the rhododendrons were very thick and where also thick masses of elder, brambles and other bushes covered a large area. In and around these thickets numbers of this small variety could be caught. More than a dozen, too, have been seen together, and a number have been caught around an old tree stump within a few hours, old and young, male and female, but many more females than males. This smaller variety very seldom associates with the typical species. The habits of the two differ considerably. It is extremely local, although it may be, as formerly at Cobham, very abundant where it occurs.

22. Badger. *Meles meles*, Linn.

Bell—*Meles taxus*.

Locally, Brock.

Rare, but probably visits most of the wooded districts at intervals. Its characteristic footprints, its habit of skinning rabbits before eating them,⁴ and scratching out wasps' nests, soon make its presence known, though it is seldom seen. It breeds annually near Maidstone and occasionally at other places. The Rev. T. R. R. Stebbing states that the keeper at Langton Kennels some years ago showed

³ Letter XV. Selborne, March 30, 1768.

⁴ The cat, fox, badger and stoat have each a different and distinct method of eating a rabbit and disposing of the skin, which experts can detect at once.

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him a fine badger which had been taken alive with its young one, but it unfortunately soon died in consequence of improper feeding.

23. Otter. *Lutra lutra*, Linn.

Bell—*Lutra vulgaris*.

Occurs in several of the streams of the

county. It is occasionally hunted at Farningham and elsewhere.

24. Common Seal. *Phoca vitulina*, Linn.

Recorded from the Thames and Medway. R. Pocock² wrote in 1809, 'seals were most uncommon.'

RODENTIA

25. Squirrel. *Sciurus leucourus*, Kerr.

Bell—*Sciurus vulgaris*.

Very common in some of the wooded districts, particularly where the sweet chestnut is grown. It has a habit of making two or three 'dreys,' or nests, at a time, which it frequents at breeding time; if its young be in any way disturbed, they are quickly removed to another 'drey.' It lives largely on nuts, but when these are unobtainable, exists chiefly on various fungi.

26. Dormouse. *Muscardinus avellanarius*, Linn.

Bell—*Myoxus avellanarius*.

Locally, Sleeper.

This interesting little mammal is widely distributed throughout the county, but probably is not very abundant anywhere.

27. Common Brown Rat. *Mus decumanus*, Pallas.

In our cornfields, stacks, hedges and buildings, and by the waterside this pest is abundant.

28. Black Rat. *Mus rattus*, Linn.

Fielding¹ mentions having seen several Kentish specimens. It is a recognized native, and the writer has seen it more than once; but in the great majority of instances when informed of its presence by country people, he has found the animal to be merely a dingy brown rat.

29. House Mouse. *Mus musculus*, Linn.

Too common.

30. Wood Mouse or Long-tailed Mouse. *Mus sylvaticus*, Linn.

The long-tailed, wood or field mouse is very abundant in some places; it seldom comes to houses. Weasels are its inveterate foes.

31. Harvest Mouse. *Mus minutus*, Pallas.

Of occasional occurrence. A specimen from Detling and a nest presented by Mr. Bunyard of Maidstone are in the Maidstone Museum.

¹ Fielding, *Memories of Malling*.

32. Water Vole. *Microtus amphibius*, Linn.

Bell—*Arvicola amphibius*.

Common, but less so than formerly.

33. Field Vole. *Microtus agrestis*, Linn.

Bell—*Arvicola agrestis*.

Locally, Short-tailed Field Mouse.

Common, and widely distributed throughout the county, but not so abundant as formerly. The Board of Agriculture, in one of its leaflets,³ reports that this animal proved a source of much loss in Kent three hundred years ago. Weasels and owls kill large numbers of them.

34. Bank Vole. *Eutamias glareolus*, Schreber.

Bell—*Arvicola glareolus*.

Mr. L. E. Adams in the *Zoologist*⁴ writes: 'Last August I came upon a nest of young bank voles amongst some refuse in a hedge bank; I am sure of its identity. I believe it to be common in the neighbourhood, although I do not remember it having been recorded in Kent before.' In another number of the same paper⁵ a very large specimen from Wingham is recorded. This was a female, and measured 6½ in. from tip of nose to tip of tail; length of head and body, 4½ in. Bell gives the length of body and head at 3-4 in., and of tail 1-5 in. Specimens are frequently met with throughout the county.

35. Hare. *Lepus europæus*, Pallas.

Bell—*Lepus timidus*.

It was commonly thought in the county that the Ground Game Act would cause this animal to be exterminated, as so much arable land is devoted to market gardening and fruit culture. But, on the contrary, it seems to be nearly as abundant now as formerly.

36. Rabbit. *Lepus cuniculus*, Linn.

Generally very abundant; so much so that it does an incredible amount of damage to

² G. M. Arnold: op. cit.

³ Leaflet No. 6.

⁴ *The Zoologist* (1895), p. 427.

⁵ *Ibid.* (ser. 4), ii. p. 477.

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crops. Black specimens are not infrequent; also occasionally some of a sandy and slate colour. A large number of a beautiful white variety existed on Mount Meadow, Cobham.

These bred promiscuously with the common coloured variety, but the young ones were usually either the one colour or the other, seldom mingled.

UNGULATA

37. Red Deer. *Cervus elaphus*, Linn.

At Watlingbury red deer are kept for hunting by Mr. Leney's staghounds. Some years ago one was left out on the Cobham Hall estate for several months, and became recognized as a native.

38. Fallow Deer. *Cervus dama*, Linn.

Preserved in several parks, and there are usually outliers which occasionally breed out. The usual colours are: (a) true fallow, (b) mineral, (c) black (very dark backs with no mottling), (d) white (dingy). The two latter

colours are less common than the others, and are not popular; park keepers are often instructed not to retain them, and consequently at the annual selection of fawns for preservation these are left unmarked, to be killed at four to six weeks old, with all superfluous ones. The others are killed at six years old.

Although usually kept in enclosed parks and fed in winter with hay, corn, acorns and chestnuts, these animals are considered to be wild, and in a recent case were successfully claimed by an heir-at-law against the legatee of the former owner.

CETACEA

39. White-beaked Bottle-nose. *Lagenorhynchus albirostris*, Gray.

Has been recorded from Folkestone and Ramsgate; several ascended the Colne in September 1889.

40. Common Dolphin. *Delphinus delphis*, Linn.

One specimen was secured at Herne Bay in 1868, and purchased by the late Frank Buckland.

41. Bottle-nose Dolphin. *Tursiops tursio*, Fabr.

Male, female and young occurred in the Blackwater in 1878.

42. Common Porpoise. *Phocaena communis*, Linn.

Common round the coast and in the Thames estuary.

43. Killer. *Orca gladiator*, Gray.

A specimen measuring 31 ft. was killed at Greenwich in 1793, and, according to Murie, others have been taken in the Blackwater.

44. Pilot Whale. *Globicephalus melas*, Traill.

A skull from the mouth of the Thames (purchased in 1858), is preserved in the British Museum.

45. Beaked Whale. *Hyperoodon rostratus*, Müll.

The skeleton of an adult female, captured at Whitstable in 1860, is preserved in the British Museum. Large specimens, over 25 ft. long, appeared at the mouth of the

Thames in July 1891, and were brought ashore at Leigh and Barking Creek.

46. Cachalot, or Sperm Whale. *Physeter macrocephalus*, Linn.

Over a century ago, on two separate occasions, a number of these enormous cetaceans—the species attaining a length of 30 to 80 ft.—were cast ashore dead, after a storm, on the Kentish and Essex coasts. One alive even got up the Thames to as far as the Lower Hope. In 1829, one 62 ft. long was secured by the Whitstable fishermen, and in August 1898 another 42½ ft. in length, went ashore at Birchington.

47. Common Rorqual or Fin-Whale. *Balænoptera physetus*, Linn. (*musculus*, Linn.).

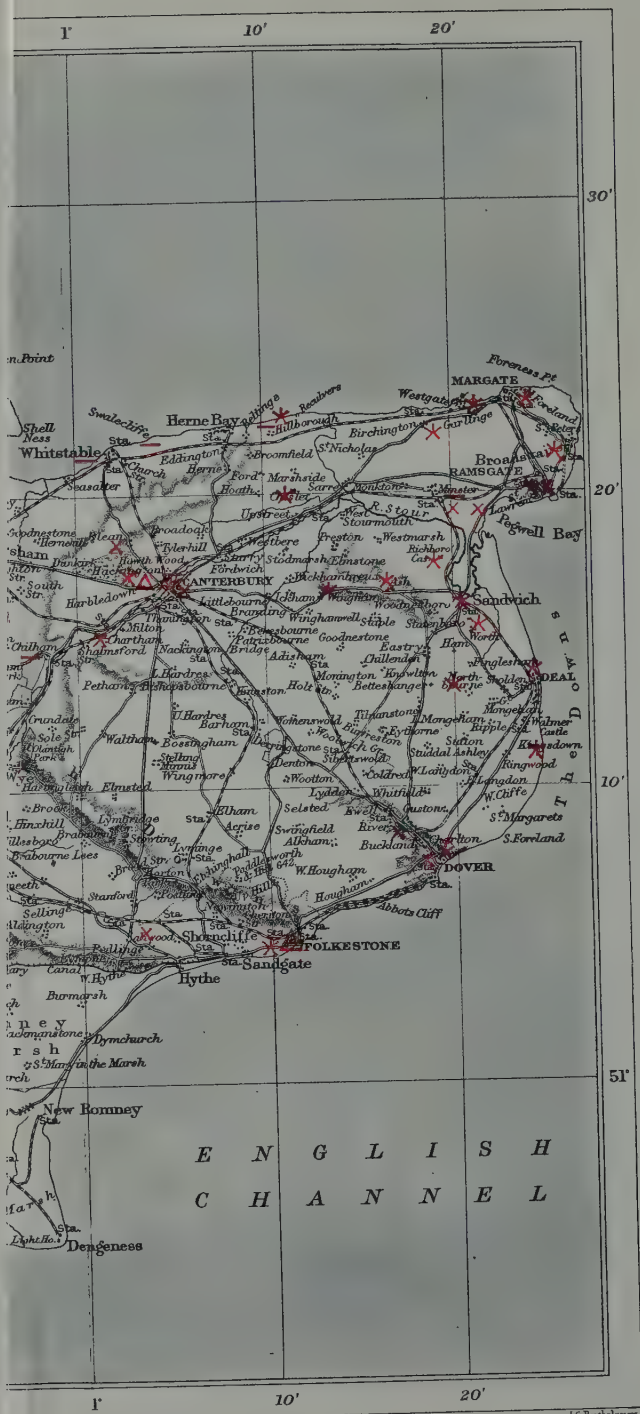
Several times recorded from the Thames. In June 1658, one 60 ft. long was killed at Greenwich. The latest appearance of this whale was in November 1899, when a fully adult couple was observed between the Albert Docks and Barking Creek.

48. Lesser Rorqual. *Balænoptera rostrata* Fabr.

Also several times recorded from the mouth of the Thames. A female 17 ft. long was killed in the Blackwater in September 1900.

49. Rudolphi's Rorqual. *Balænoptera borealis*, Less.

One specimen, 35 ft. long, was stranded outside Tilbury Dock in October 1887, and a second was captured at Gillingham in the Medway in August 1888.



EARLY MAN

AMONG the various counties of England probably there is none which has furnished a more complete and representative series of prehistoric remains than Kent. Every one of the different ages into which antiquities divide the prehistoric period is represented among the antiquities of Kent, and in some cases discoveries of exceptional importance have been made within the borders of the county.

There is perhaps no large part of England which has been more carefully or more successfully studied by antiquaries. The result is that many important observations and discoveries have been placed upon record ; and in attempting to give a brief but comprehensive sketch of them, it seems desirable to follow the plan adopted in the case of other counties, employing the following main divisions :—(1) Palæolithic Age ; (2) Neolithic Age ; (3) Bronze Age ; (4) Prehistoric Iron Age.

THE PALÆOLITHIC AGE

The stage in human culture known as the Stone Age has been divided by archaeologists and anthropologists into two somewhat sharply defined sections, viz. the Palæolithic Age and the Neolithic Age. There is every reason to think that these two ages were separated by a long interval of time, during which either man did not exist in this part of Europe or the evidence of his presence has perished.

Our knowledge of the Palæolithic Age is derived mainly from stone implements, articles of bone, etc. Certain rude sketches scratched on bones and stones have been found on the Continent of Europe, and these suggest that the men of this earlier Stone Age possessed a much higher degree of artistic culture than one would have been prepared to expect. It is a remarkable fact that although man was able at such an early stage to sketch the mammoth and other animals from life in such a way that the likeness can now be recognized, he had not acquired the art of shaping weapons or implements of flint by means of grinding or rubbing. Indeed, it is a characteristic mark of palæolithic implements of flint that the shaping has always been produced by chipping, and sometimes, of course, the forms have been modified by wear and the re-sharpenings by chipping which thereupon became necessary. This applies specially to implements formed of flint, but it is impossible to say how far it is true of other materials, or even other kinds of stone, because the character of the weathering and method of disintegration vary according to the substance.



PALÆOLITHIC IMPLEMENT FROM RECVLVER.

EARLY MAN

Palæolithic implements occur on the surface of the ground and in beds of gravel. The latter, which may be conveniently considered first, may be divided into the following three classes : (1) deposits of gravel in the form of terraces near the beds of existing rivers, such as those in the valleys of the Thames, the Stour, and the Cray ; (2) deposits occupying valleys which, although obviously shaped to a large extent by river action, are now dry ; and (3) deposits on elevated ground, such as those on the North Downs.

The occurrence of palæolithic implements in the gravels of the Thames Valley at Swanscombe, Northfleet and other places in Kent as well as in Middlesex, Essex, etc., is of great interest because on examination it will be found that many of the implements have been worn in just the same way as have the flints of which the gravel is composed. They have clearly been subjected to the same abrading forces, and therefore they must have been shaped by man at a period prior to the deposition of the gravel. It is also equally clear that the waters of the river have much diminished since that time.

The second class of deposits, occurring in valleys which are now dry, are admirably illustrated by the implement-bearing gravels of West Wickham, the upper part of the Valley of the Cray, etc. As these implements are to a very large extent much drift worn, it is pretty clear that they must be referred to an origin quite as remote as, if not more remote than, the period when these dry valleys were important water-courses.

The third class, to which the high level gravels on the top of the North Downs belong, presents a more difficult and complicated problem. If these deposits of drift-worn gravel have ever been connected with a river system it is certain that very great changes must have been produced subsequently by denudation, and it seems at any rate probable that they were intimately associated with the forces by which the Wealden district was denuded.

Considerable interest has been aroused in recent years by discoveries of palæolithic implements in an abraded condition and lying at great altitudes on the chalk plateau. The subject has already been discussed by the late Professor Prestwich¹ and others.² Some antiquaries as well as geologists (for the question comes within the scope of both archæology and geology) have been inclined to think that an interval of time, far greater than had hitherto been imagined, has elapsed since the implements were made ; but the conclusion seems rather rash and entirely without scientific value, seeing that we have no positive, nor even approximate data as to the rate at which the changes of level, whether produced by denudation or otherwise, have been effected.

In order to distinguish these high-level implements from others occurring at lower levels the term *eolith* was applied to them, and

¹ On the occurrence of palæolithic flint implements in the neighbourhood of Ightham, Kent, *Quart. Journ. Geol. Soc.* (May 1889), pp. 270-97.

² F. C. J. Spurrell : 'Palæolithic Implements found in West Kent.' *Arch. Cant.* xv. 89-103, etc.

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certain more or less abraded and weathered fragments of flint bearing no trace of human workmanship were associated with them and included under the name of 'eolithic implements.' Flints of this character, bearing no trace of having been artificially shaped, but only some battering and bruising at the edge which were attributed to wear arising from use as implements, were naturally viewed with suspicion by the scientific world. This suspicion was not lessened but rather increased when the so-called 'eolithic implements' were found to be procurable in large numbers at different places in the district, because it became more than ever clear that they were purely natural forms produced either by the forces which crushed and abraded the river and drift-gravels, or by forces which have operated upon the gravel-beds since their deposition, such as ice-pressure, earth movements, and the like.¹

It is quite clear, however, that a small proportion of what are called eoliths found at high elevations on the chalk plateau of Kent and elsewhere, are of human manufacture, and as their essential features resemble in every way those of the Palæolithic Age, we propose to deal with them under that head. But as far as 'eolithic implements' are concerned it seems evident that a large proportion must be rejected as lacking any evidence of human workmanship or signs of wear arising from intelligent use.

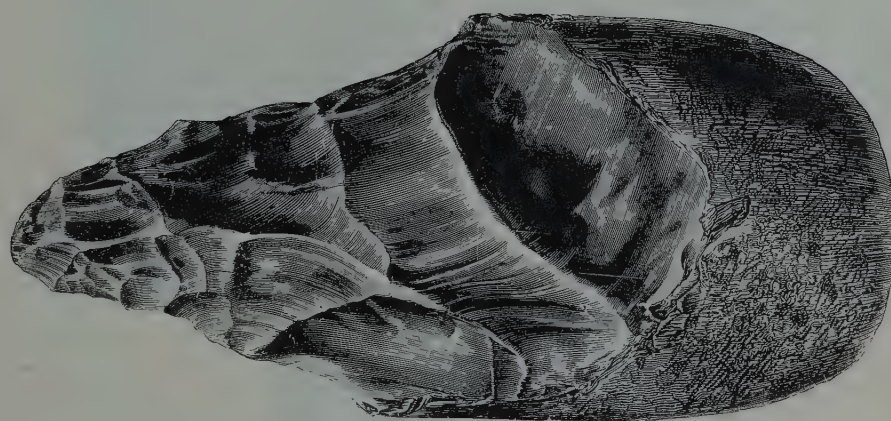
A large number of palæolithic implements discovered in Kent have been found on the surface of the ground. Some of these are drift-worn and were probably derived from drift gravel, but others are wonderfully sharp and entirely unworn. These latter have evidently been preserved from injury by being buried in the earth. The specimens of palæolithic implements and chips found by Mr. F. C. J. Spurrell,² many years ago, buried in sands and clays near Crayford Church, were as sharp as when first fractured by man, and show little alteration of surface. In a very large proportion, however, the implements generally speaking have undergone some degree of wear, great or small, and the superficial colour and even texture of the flint has undergone some change. The colouring acquired is usually of a reddish or brownish, and sometimes ochreous or yellowish hue, whilst the texture of the mineral has been so altered as to produce greater opacity and a less horny appearance than is usually found in an ordinary chalk flint freshly broken.³ This alteration of the character of the flint extends sometimes only a little below the surface, and sometimes to a considerable depth.

A very large number of places in Kent have yielded palæolithic implements, but as these will be individually mentioned in the topographical list at the end of this article, it will not be necessary to refer to

¹ Since the above was written, the possibility of these pieces of flint having been shaped by natural forces, has been clearly demonstrated by Mr. S. Hazzledine Warren, F.G.S., before the Anthropological Institute (London).

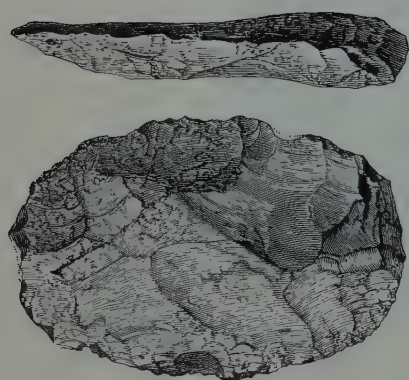
² *Arch. Journ.* xxxvii. 294-99.

³ It is possible that the colouring matter, protoxide of iron, has been produced by the flint itself in the ordinary process of decay. See *Quart. Journ. Geol. Soc.* lvi. 8, 9.

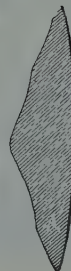


Reculver.

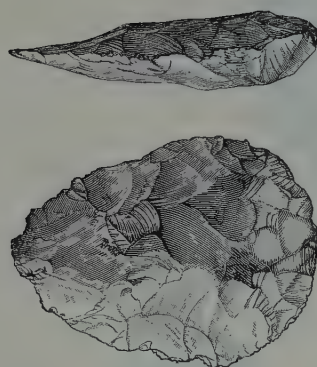
PALEOLITHIC IMPLEMENTS FOUND IN KENT.



Reculver.



Canterbury.



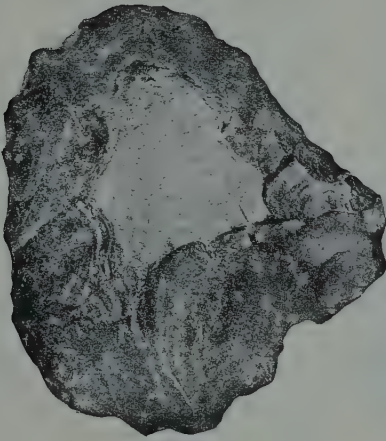
Folkestone.



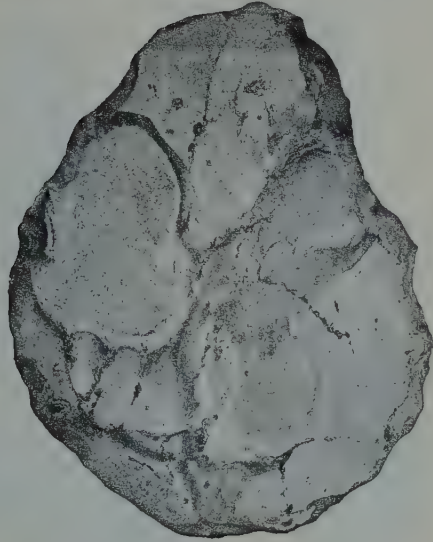
Swanscombe.



$3\frac{1}{2}$ ins. \times $2\frac{1}{2}$ ins.



$3\frac{1}{2}$ ins. \times 3 ins.



$4\frac{1}{2}$ ins. \times $3\frac{1}{2}$ ins.



$4\frac{1}{2}$ ins. \times $3\frac{3}{4}$ ins.

PALÆOLITHIC IMPLEMENTS, WEST WICKHAM.

EARLY MAN

them here in detail. The following are the more important parishes or districts in which discoveries of palæolithic implements have been made :—

THE THAMES VALLEY. The excavation of chalk for lime and cement-making has for some time past afforded numerous opportunities of examining the overlying beds of drift-gravel which occur at various parts of the Thames Valley. This is particularly true of the district about Swanscombe, Northfleet, Stone, etc., where in a high-level bed of drift-gravel many hundreds of palæolithic implements, cores, and waste chips, have been found. Some of these flints have sharp edges, ridges and points, and can hardly have been transported far down the valley, but others are somewhat worn. The curious chopper-like implement shown in the accompanying photograph is of considerable interest on account of the marks of wear it bears on its convex side, the concave side bearing no such marks, having been protected.

It was in a gravel bed near Swanscombe, that the famous Galley Hill skull and limb bones were discovered in the year 1888. It was considered by some that these human remains were contemporary with the gravels in which they were found, but definite evidence is wanting.

An ovoid, or perhaps almond-shaped implement was found by Mr. Spurrell 8 ft. deep in Thames Valley gravel at Dartford Heath.

RECVLVER. From about the year 1860 to the present time palæolithic implements in considerable numbers have been found on the sea-shore between Reculver and Herne Bay. Investigation of the cliffs at this place has shown that there is a bed of gravel at the top of the escarpment from which the implements have fallen from time to time. When they first fall to the beach their points and ridges are sharp, but the action of the waves and sand soon modifies this. Some magnificent specimens of pointed implements have been found here at various times by Mr. Thomas Leach, Mr. John Brent, F.S.A., Sir Joseph Prestwich and Sir John Evans, and four engravings of them are here reproduced by the kind permission of Sir John Evans. One is formed from a pebble, the rounded butt of which has not been chipped, but its shape is well adapted for being held in the hand. The larger implements shown full-size in the accompanying engravings are admirable examples of their kinds, that with incurved sides showing a refinement of form which is very rarely found in palæolithic implements. Another rare form with very thick butt and tapering and slightly twisted point, once in the collection of the late Mr. John Brent, is also shown.

Palæolithic implements evidently derived from a bed of drift-gravel at the top of the cliff have been found on the shore as far as a mile and a half to the west of Reculver.

MINSTER, THANET. A small pointed palæolithic implement was found here in 1899 by Mr. J. Romilly Allen,¹ F.S.A. It would appear to belong to the same set of drift-gravels as those near Reculver, except that it has not suffered drift-wear; but in any case it is of considerable interest as occurring so far to the east of the Reculver gravels.

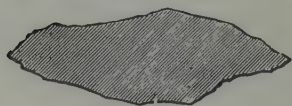


PALÆOLITHIC IMPLEMENTS FROM THANINGTON.

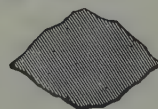
¹ *Reliq.* vii. 57.



Reculver.



Bewley, Ightham.



Reculver.

PALÆOLITHIC IMPLEMENTS FOUND IN KENT.

EARLY MAN

THE MEDWAY VALLEY. A large number of implements of palæolithic character have been obtained from various parts of this valley. Aylesford, Cuxton, St. Mary Hoo, Sandling, and West Malling have all furnished examples, and specimens are preserved at Maidstone Museum as well as in private collections.

THE CRAY VALLEY. Implements have been found here at three places. Sir John Evans found, at an elevation of over 500 ft. in Currie Wood, one which Mr. Spurrell considers a 'land' implement, having been but little worn by drift action. Some years ago Mr. H. G. Norman found two at Green Street Green in the upper and dry part of the valley; and in 1901 the present writer¹ obtained a drift-worn implement at a point about a quarter of a mile south of Orpington Church, some distance lower down the valley. Other palæolithic implements about forty in number have been found at Green Street Green by Mr. de B. Crawshaw.

THE DARENTH VALLEY. Implements have been found in this valley at more than one point. Mr. W. Whitaker, F.R.S., found one near Horton Kirkby at an elevation of 250 ft.; and Mr. F. C. J. Spurrell discovered another near Erith, whilst in the Crayford brick earths he found indications of the important factory already mentioned.

THE RAVENSBOURNE VALLEY. Among the numerous winding valleys cut in the chalk of West Kent there are several which may be considered to form part of the present watershed of the Ravensbourne, although owing to the porous nature of the rock below they now contribute little if anything towards the stream. It is clear, however, that at some former time the conditions were very different: the forms of the valleys and the water-worn gravels which lie within them indicate that the whole district has been very much subjected to erosion by water in rapid motion, probably accompanied by low temperature.

In one of these valleys lying in the eastern part of the parish of West Wickham² numerous palæolithic implements were found by the present writer in 1880 and subsequently. They exhibit almost every degree of wear, and the amount of abrasion visible on some is remarkable.³ The implements which were found in various parts of the valley, but specially in Church Field, exhibit considerable varieties of shape, the predominating forms being discoidal, ovoid, and almond-shaped.

Examples of the chief forms are given in the accompanying photographs. Judging from the great variety of form, colouring, and amount of wear on the implements it is probable that the drift-gravel in which they occur has been brought from a great variety of places, and has undergone many changes.⁴

IGHTHAM. The whole district round Ightham⁵ has been thoroughly and carefully examined by Mr. Benjamin Harrison, with the result that a very large number of places have yielded prehistoric remains. Palæolithic implements have been found in the gravels of the Shode Valley and at many other points. On the high ground to the north, in the parish of Ash, Mr. Harrison has discovered large numbers of flints of dark brown colour and exhibiting abrasion at the edges to which the term eolithic implements has been applied. The question whether they have or have not been shaped by man has, as just mentioned, been the subject of much discussion for some time past, and the whole question has engendered considerable warmth. In any case it is quite clear that some extremely interesting implements of palæolithic workmanship have been found at high levels in the Ightham district.

At Oldbury Hill, which lies to the south of the village of Ightham, some important evidences of rock shelters⁶ were discovered in 1890. Excavations in the talus near the bold, projecting spur of the hill, and just below Mount Pleasant, revealed a large number of palæolithic flakes, 49 well-finished implements, and upwards of 600 waste chips of flint. It is evident, therefore, that the shelter was used as a dwelling-place by several individuals, and that the manufacture of implements was carried on at the place. From the number of neolithic implements found near this shelter it seems probable that this part of Oldbury Hill was utilized as a rock shelter at one time by the neolithic inhabitants who doubtless occupied the hill itself and constructed around it defensive works.

There are many other parts of Kent where palæolithic implements have been discovered, but these will be detailed in the topographical list at the end of this chapter.

¹ *Quart. Journ. Geol. Soc.* lvii. 98.

² *Proc. Soc. Antiq.* (ser. 2) xi. 161-66; *Arch. Cant.* xv. 100-2.

³ Mr. F. C. J. Spurrell was of opinion that it was due to the action of waves on a sea-beach (*Arch. Cant.* xv. 101).

⁴ See *Quart. Journ. Geol. Soc.* lvi. 9.

⁵ Evans, *Stone Imp.* 608.

⁶ *Brit. Assoc. Rep.* 1891, pp. 353, 652.

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THE NEOLITHIC AGE

Some writers,¹ judging from the flint implements found in various parts of Kent, have been inclined to think that they can trace evidence of an intermediate stage between the Palæolithic Age and the Neolithic Age. The term mesolithic has been suggested for this period, but although there are undoubtedly intermediate types as far as form is concerned, and neolithic man may have been influenced in his tool-making by palæolithic tools² found on the surface of the ground, it must not therefore be concluded that there was continuity of race. The evidence points fairly clearly to the existence of a long interval between the two ages, during which great physical changes took place, one of which being the severance of the British Isles from the Continent.

The Neolithic Age forms a very important chapter in the pre-historic past of Kent. Many competent observers have turned their attention to the subject, and there is quite a considerable literature illustrative of it. This will be referred to in the foot-notes; but the following account must necessarily be as concise as possible.

From the large numbers of implements found in nearly every part of Kent, one is justified in assuming that there was a large population here during the Neolithic Age. Stone implements and weapons, earthworks, burials and associated megalithic structures all point to this conclusion. Worked flints have been found in practically every parish in Kent, but traces of dwellings and graves are much less abundant. There can be no doubt that the extensive cultivation of the soil is responsible for their disappearance. Careful research, however, particularly in places where the land is too poor to repay the trouble of cultivation, has shown that traces of dwellings of the Neolithic Age remain in greater numbers than had generally been suspected hitherto.

The following are brief particulars of the more important indications or remains of neolithic settlements in Kent :

BROADSTAIRS. Between Broadstairs and Ramsgate quite close to the little valley known as Dumpton Gap, which runs down to the sea, the present writer has found numerous flakes, scrapers and cores of flint of a character and under circumstances which point to the probability of this having been a settlement.³ Some of the implements, found here and at Birchington, and other parts of this coast have been made out of the tabular flint which occurs in the adjacent chalk cliffs.

DARTFORD HEATH. There are several earthworks of various periods here. Some of them were probably made in the middle ages and for military purposes,⁴ but others are apparently examples of the regular saucer-shaped depressions which have received the misleading name 'pit-dwellings,' and the scarcely more appropriate designation 'hut circles.' They are apparently exactly like those hut-floors in other parts of West Kent which have been shown to belong to the Neolithic Age.

FOLKESTONE. Flint implements have been found here in abundance, and there can be no doubt that there was a neolithic settlement in the neighbourhood.

¹ F. C. J. Spurrell in *Arch. Cant.* xviii. 306; J. Allen Brown in *Journ. Anthropol. Inst.* xxii. 73, and New Ser. ii. 139-40. See also *Arch. Journ.* liii. 218-19.

² Some palæolithic implements have been found which have been re-worked in neolithic times.

³ Col. A. Lane Fox has described several different deposits of flint implements in and near St. Peters, Thanet, associated with Roman remains. See *Journ. Ethn. Soc.* (1868) i. 1-12.

⁴ *Arch. Cant.* xviii. 309.

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GROVEHURST, MILTON, NEAR SITTINGBOURNE. Some good examples of neolithic hut-floors were found here in the year 1871, but the exact archaeological significance is considerably obscured by the fact that with curious persistence they have been described as Celtic in the published accounts.¹ Among the remains found were large numbers of flakes, and various implements such as arrow-heads, knives, ground celts, etc., the whole mixed up with a layer of vegetable matter that had accumulated upon the floor to a depth of about 1 foot.

HAYES. On Hayes Common² there are several groups of neolithic hut-floors associated with lines of ditches and mounds. These are circular in outline, they vary in form and size from shallow depressions a few inches deep and about 4 ft. in diameter to hollows 2 ft. 6 in. deep and about 30 ft. in diameter, and they fall into the three following pretty well defined types:—

1. Large pits from 10 ft. to 30 ft. in diameter, and from 6 in. to 2 ft. 6 in. deep, surrounded by a mound, with trace of entrance, and containing no considerable traces of fire. (See diagram, fig. 1.)

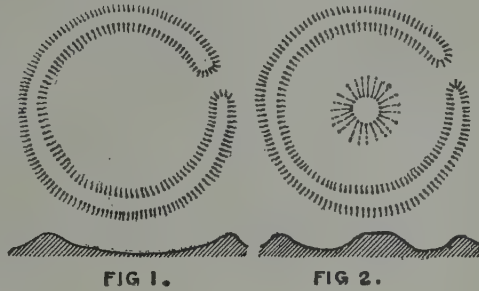
2. Pits similar in every way, but with a low conical mound in the centre. (See diagram, fig. 2.)

3. Small pits from 4 ft. to 10 ft. in diameter without an encircling mound, and containing numerous reddened pebbles, fragments of charred wood and other indications of fire. (See diagram, fig. 3.)

The first and second types were undoubtedly the floors of huts for human habitation, whilst the third represents the sites of cooking fires placed at some little distance away from the dwellings, which were constructed of interlaced branches and other inflammable materials. From the shape and contents of these cooking holes it seems probable that the fire was made on a large scale and maintained for a long time so as to make the earth sufficiently hot to cook whole animals. This theory agrees with the evidence afforded by the arrangement and disposition of the hut-floors; because it is clear that the dwellings were built in groups of from four to six huts, each capable of accommodating from two to six individuals. Several of these groups occur on Hayes Common, and it is extremely probable that the neolithic tribes here lived in small communities. Neolithic implements and flakes have been found at various

parts, but it is probable that many more lie buried in the turf and the layer of peat which lies below it.

In addition to the actual earthen circles round the ancient hut-floors there are, evidently in association with them, a good many lines of ditches and mounds enclosing spaces in which animals may very well have been secured. Attention was drawn to these works in 1878 by Mr. W. M. Flinders Petrie, who read a paper entitled 'Notes on Kentish Earth-works',³ at a meeting of the Kent Archæological Society at Bromley in that year. Mr. Petrie drew



DIAGRAMS SHOWING TYPES OF NEOLITHIC HUT-FLOORS AND COOKING PITS AT HAYES COMMON, KENT.

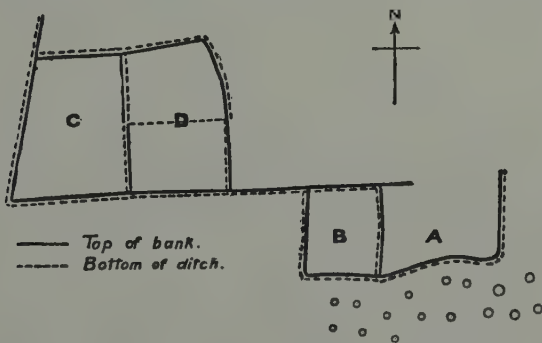


DIAGRAM NO. 1. REMAINS OF STOCKADED ENCLOSURES, HAYES, KENT.

¹ *Arch. Cant.* xviii. 122-26; and *Coll. Cant.* 1-5.

² *Arch. Cant.* xviii. 15-16; *Proc. Soc. Antiq.* (ser. 2) xii. 258-63.

³ *Arch. Cant.* xiii. 8-16.

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special attention to two groups of ditch and bank work, and suggested that in one case (see diagram 1) the banks probably represented field divisions. He pointed out, what indeed is a significant fact, that although about forty hut-floors occur just outside these enclosures, none are found within them. Had Mr. Petrie's theory as to field divisions been proved by further examination to be tenable, this circumstance might have been very naturally explained by supposing that all traces of any floors within the enclosures had been destroyed during the process of cultivation. Careful examination of the site, however, enables the present writer to state with confidence that the soil, at this part of the Common, at any rate, has never been cultivated. The absence of floors within the enclosures is therefore of considerable value as tending to show that the latter were for the purpose of enclosing cattle at night, or perhaps at other times when wolves were in the vicinity. Doubtless the banks were surmounted by hedges or fences.

The banks may be described as protective rather than strictly defensive earthworks. Although the forms of the enclosures are somewhat irregular, there is a pronounced tendency towards a square or oblong. This will be seen in the diagram No. 1, representing the enclosures containing no hut-floors, already mentioned. These enclosures, which are doubtless coeval with the neolithic dwellings, probably represent successive stockaded enclosures, be-

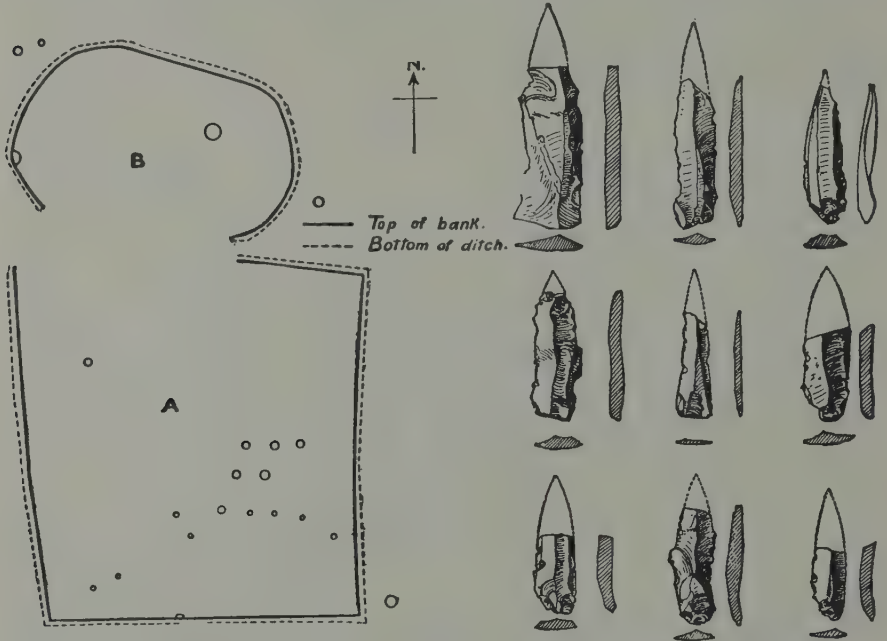


DIAGRAM NO. 2. ENCLOSURES AT HAYES, KENT.

NEOLITHIC FLAKES FROM MILLFIELD, NEAR HAYES COMMON.
(scale: $\frac{1}{2}$ linear).

cause the ditch from which the material for the bank was derived occurs in some cases on the inside of the enclosure, and this points pretty clearly to intervals between the construction of different enclosures. In the diagram A shows an earlier enclosure than B, and C is earlier than D. In D, however, there seems to have been originally a dividing line cutting the oblong into two nearly equal shapes. All traces of the dividing line are lost, and the thin dotted line in the diagram is merely conjectural and intended to explain the peculiarities of the enclosing ditches and banks.

Another group of enclosures, probably of earlier type, is shown in diagram No. 2. In this case the rectilinear work A is probably earlier than the oval enclosure B, because the former was partly destroyed when the latter was constructed. Both square and oval enclosures were probably disused at a very early time, as traces of neolithic dwellings are found both within and without the banks, and indeed in one case a hut-floor has been cut somewhat into the actual bank of the oval work.

KESTON. At Millfield, Keston,¹ adjoining Hayes Common, the site of a factory of neolithic

¹ *Proc. Soc. Antiq.* (ser. 2) xvii. 216-21.

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implements was discovered towards the end of the year 1897. This was a circular area about 14 ft. in diameter, and upon a careful examination of the ground being made nearly one thousand pieces of flint were found, consisting of upwards of twenty cores, considerably more than four hundred flakes, and a rather larger number of waste chips. All the cores were small, and would not have been capable of producing flakes more than 3 in. long. The flakes, which are in most cases straight, well made, and triangular in section, have generally lost their pointed end consisting of about one-fourth or one-third part of the original length. About 40 per cent. of the flakes had been broken in this way, and as the missing parts must have been sharp, pointed, and more or less triangular in form, it is probable that they have been purposely broken off and employed as arrow-heads or possibly as sickle-teeth, and thus dispersed over the surrounding district. It is significant that not one of the pointed ends was found at Millfield, although examples have been found by the present writer at Hayes Common.

One of the interesting facts about this discovery is that it tends to establish beyond the possibility of doubt the fact that the hut-circles on Hayes Common are of Neolithic Age. Hitherto this had rested upon negative rather than positive evidence, but it is now fairly clear that the Millfield factory forms one of the group of settlements at Hayes Common, and that all the floors there may be referred to the Neolithic Age.

IGTHAM. About thirty floors of dwellings, in every case associated with neolithic chips, flakes, cores, and implements, have been discovered in this parish.

The more important finds of neolithic implements will be noted in the topographical list at the end of this article, but one or two special features are worthy of notice here.

The first is the discovery of a large number of neatly chipped flint arrow-heads at Linton, a parish about 4 miles to the south of Maidstone. No less than sixty-five examples of these objects, which are usually very rare in Kent, are now in the Maidstone Museum.

Another remarkable feature of the neolithic remains in Kent is the comparative abundance of roughly chipped celt-like implements, from 6 in. to 8 in. in length, and of considerable weight. Besides the examples recorded by Sir John Evans from Shoreham and other places, the present writer has found several objects of this character at West Wickham. There seems good reason to believe that they were hoes or somewhat analogous implements for agricultural purposes.

An important class of remains of this interesting age are the megalithic monuments associated with burials, and these will be dealt with in the following section.

Megalithic Remains

All the megalithic remains of Kent are situated in the central part of the county, in the neighbourhood of Maidstone. Precisely speaking, the district in which they lie is bounded on the east by Boxley, and on the west by Wrotham, the river Medway running through it.

Though not remarkable numerically, these antiquities are of great archæological importance. It is probable that they are all of sepulchral origin, and in two cases the original characters have been sufficiently retained to enable antiquaries to refer them without hesitation to the Neolithic Age. The other megalithic structures, which have fallen, were probably reared for a similar purpose, and there is reason to think that the various members of the whole group belong practically to the same period, and were constructed for sepulchral purposes.

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The material used in these prehistoric monuments is sarsen stone, or greywethers, a species of tough sandstone, which occurs naturally scattered about the surface of certain parts of the North Downs and elsewhere. This stone was also largely used at Stonehenge. As far as the Kentish megalithic structures are concerned, the stone does not seem to have been artificially shaped, except perhaps in one instance, but such blocks as were of suitable size and shape seem to have been selected and brought together. The following are the chief Kentish examples :

KITS COTY HOUSE, the best known and the most perfect example of its kind in Kent, stands out boldly on the side of the hill a little below the extensive chalk pit at Blue Bell Hill. It is situated $1\frac{1}{2}$ miles north-east of Aylesford, and on sufficiently high ground to command extensive views over the country lying to the south and the west. The structure consists of four stones arranged in the form of a simple cromlech. Three of the stones are upright and support a large flat cap-stone. The upright stones, which are arranged in an H-shaped plan, are of the following dimensions :—the south-west stone is about 8 ft. high, whilst its breadth at the base is 6 ft. 2 in., and its thickness about 1 ft. 8 in. ; the north-east stone is about 7 ft. high, 6 ft. 8 in. broad, and 2 ft. thick ; the middle stone, which is of irregular form, is 6 ft. 10 in. in greatest height. Upon the top of these stones is placed a capstone measuring 12 ft. 10 in. by 9 ft. 3 in., and in some parts it is about 2 ft. thick. The fact that the two main upright stones have an inclination inwards imparts to them great strength and stability, especially as they are prevented from falling inwards by the middle stone or outwards by the enormous weight of the capstone.

The size of the capstone is sufficiently large to project beyond the supporting stones. It is pentagonal in form, and so poised on the upright stones as to slope considerably towards the north-west, a circumstance which was once held by archæologists ¹ to point to the probability of its having been a sacrificial altar used by the Druids.

A useful clue to the real object and purpose of Kits Coty House is furnished by the engraved plate of the monument published in 1776 by Dr. Stukeley,² in which the stones are represented as standing at the end of a long, low mound. There are also some valuable particulars both of Kits Coty House and Lower Kits Coty House as they appeared in 1732 in a letter from Hercules Ayleway ³ to Dr. Stukeley, as the following extract will show :—‘ from the N.W. front of this upper Cotty House are extended a parcell of small stones in the form of branchii, or arms, or arches of circles ; on the N. west side they are doubly rowed, but the S. east arm is either buried or the stones carried away, from the extremitys of which arms I conjecture there has been an avenue, by reason of the many stones I find disposed in or very near a right line, and exactly corresponding with the said arches, which avenue leads to a little farm called Tottendan Place, about 800 yards west of the Cotty House ; it was moated round, and whileome was a place of good strength.’

There is no reason to doubt that Kits Coty House was originally a long barrow enclosing a stone sepulchral chamber of the well-known neolithic type. It seems quite possible also, judging from the foregoing extract from Ayleway’s letter, that the barrow was enclosed in a ring of stones. Agricultural operations, rain-wash, and the excavations of treasure-seekers, are sufficient to account for the entire disappearance of the barrow and the circle of stones by which it was surrounded.

The division of the space between the supporting stones by the intervention of the middle upright stone, a circumstance which inclined Dr. Stukeley to the opinion that this could not have been a sepulchral cist, does not really present any serious obstacle to the explanation suggested. It points rather to the conclusion that this was a double cist, a feature which, as will presently be shown, is in harmony with another Kentish example.

In the engraved picture in Dr. Stukeley’s *Itinerarium Curiosum*, already referred to, is shown a point marked ‘ the General’s tomb.’ This is clearly distinct from the recumbent monolith, also shown in the engraving lying nearly a mile nearer Aylesford, and popularly

¹ King, *Mun. Antiq.* i. 220 et seq.

² Stukeley, *Itin. Curios.* (ed. 2) Plates 31 (2), 33 (2), and 34 (2).

³ Dr. Stukeley’s *Diaries and Letters* (Surtees Soc.), lxxiii. lxxvi. lxxx.



KITS COTY HOUSE.



THE FALLEN STONES NEAR KITS COTY HOUSE.



MEGALITHIC REMAINS, ADDINGTON.

EARLY MAN

known as 'the coffin stone,' so called from the fancied resemblance of its shape to that of a coffin.

LOWER KITS COTY HOUSE. This is the popular name of a group of large stones situated in a field lower down the hill in the direction of Aylesford. The group is also known as 'the countless stones,' from the fact that it is by no means easy to count their number owing to the confused condition in which they lie. Stukeley¹ gives, in the engraving, a bird's-eye view and plan of this structure, from which it appears that there were ten upright stones arranged roughly in the form of the letter D, and apparently two capstones. Stukeley's ideas on these points, however, were purely conjectural and valueless. All the blocks of which the Lower Kits Coty House was composed appear to be of more regular shapes than those used in the Upper Kits Coty House. From accounts which have been preserved it seems that what is now a fallen heap of from sixteen to twenty stones consisted originally of some four or five cromlechs. They lie on a space of ground measuring 20 ft. 7 in. from north to south, and 29 ft. 7 in. from north-east to south-west. The stones were thrown down in the early part of the eighteenth century, and between the years 1772 and 1824 they suffered considerable further damage. At one time it was proposed to break them up into smaller blocks and take them down the river to Sheerness for the paving of the barracks there, but fortunately the stones proved to be too hard for the purpose.

Beyond the fact that this must have been a very important megalithic monument or series of monuments it is impossible to say much definitely about it.

THE COFFIN STONE. Reference has already been made to this magnificent recumbent monolith. It lies in an open field at Great Tottington Farm, practically opposite Lower Kits Coty House, and measures 14 ft. 6 in. in length, 8 ft. 6 in. in breadth, and about 2 ft. in thickness. Several human remains, including two skulls, were found in association with this massive stone in 1836.

STONES ON BLUE BELL HILL. Just above the site of Kits Coty House there are several scattered stones which were considered by the late Mr. Thomas Wright to be the coverings of, or entrances to, sepulchral chambers. It was found that each group of stones was surrounded by a small circle of stones, and excavations carried out in 1844 showed that one of these stones was laid across what was apparently the mouth of a round pit cut in the chalk and filled with flints. According to the reports of the inhabitants of the district many similar pits had been found on the hill in former times, and generally one or two large stones were found placed in the pit's mouth. Enormous numbers of flints were found in the pits, and many of them were utilized as road metal when a new road was made.²

ADDINGTON. There are in Addington Park, nearly 5 miles to the west of Aylesford, several stones occurring in groups or as separate monoliths which having once received the appellation 'Druidical circles' have, without the slightest reason, continued to be called circles even by those who have abandoned the position that the stones were of Druidical origin.³ In 1878, however, Mr. W. M. Flinders Petrie⁴ published a careful description and plan (the latter based upon actual survey and probing) in which it was clearly shown that the stones form an avenue of two parallel lines with a chamber (now disturbed) at the north-east end. The importance of this fact was at once perceived by Mr. Petrie. He writes: ⁵ 'There seems to be a type in these Kentish works; at Kits Coty in Stukeley's time, there was a long mound, with the chamber at one end; at Addington, there is a chamber at one end of a long mound, which has a row of stones along it; and at Coldreham there is similarly a chamber, and a row of stones leaning in against a slight elevation of earth around it, in both cases the chamber being at the east end of the long group.'

There are three principal groups of stones at Addington. The first, on the right-hand side of the road leading from Addington Church to Wrotham Heath, consists of a large upright mass of rock somewhat pyramidal in form, 6 ft. 6 in. high, 8 ft. broad at the base, and 1 ft. 5 in. thick. Near it is a large recumbent slab, probably a capstone, and measuring 15 ft. by 9 ft. 8 in. and 1 ft. 9 in. thick. The other stones in this group are not remarkably large.

The second group, which is situated a few yards further on, on the same side of the road, contains three stones, two lying nearly flat and one standing almost upright. The upright stone is 5 ft. 2 in. high.

¹ Stukeley, *Itin. Curios.* pl. 32 (2).

² *Arch. Journ.* i. 264.

³ *Arch.* ii. 107 et seq. G. Payne, in *Coll. Cant.* (1893), p. 140, speaks of 'an imperfect circle' at Addington.

⁴ *Arch. Cant.* xiii. 14, 16.

⁵ *Op. cit.* 14.

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The third group lies also on the right-hand side of the roadway, but at a distance of about 50 yards from it. It contains many large stones lying in a state of confusion, which suggests that the whole structure has either tumbled down or been purposely destroyed. A vigorous growth of bushes unfortunately hides some of these large blocks of stone, but some are visible, and one, which may perhaps have served as a capstone, measures 12 ft. 6 in. by 7 ft. 8 in., and is 2 ft. in thickness. It is this third group of stones which Mr. Petrie shows to have occupied the north-east end of the avenue.

COLDRUM. Remains of an important megalithic structure exist at Coldrum Farm in Trottscliffe parish, situated about $1\frac{1}{2}$ miles north of the stones in Addington Park just mentioned, and about $\frac{1}{2}$ mile north-east of Trottscliffe Church. As already mentioned in quoting Mr. Petrie's description, these stones at Coldrum or Coldreham (as he calls it) are arranged in the form of a quadrangular enclosure round a central chamber of which the two massive upright stones still remain. A glance at the stones, both those which formed the central chamber and those which surrounded it, is sufficient to show that this was a monument of quite equal if not superior importance to that at Kits Coty House, and it is interesting to note that while that at Coldrum stands on the west bank of the Medway, Kits Coty House stands on the east bank. Both are situated on the lower slopes of the chalk hills, yet sufficiently high to command extensive views and to be visible the one from the other.

Another interesting point of similarity in the two cromlechs is that the space between the two main upright stones is pretty evenly divided by transverse stones, in the case of Kits Coty House by one, in that of Coldrum by two. In both cromlechs, therefore, we find double chambers, intended probably for two interments. The capstone is lacking in the Coldrum cromlech, but the two main upright stones, which are still in their original position, are remarkably massive, one being 11 ft. long, 7 ft. 2 in. high, and 2 ft. 3 in. thick, whilst the other is only slightly smaller. One of the largest of the stones forming the quadrangular enclosure is placed obliquely in the earth, and doubtless a considerable portion is below the surface; what is visible, however, measures 8 ft. 8 in. wide, 5 ft. high, and 3 ft. thick.

That the Coldrum cromlech was of great importance seems quite clear, and if the curiously square and regular forms of the upright stones are due to artificial shaping, the structure may be regarded as not only the finest, but also the latest example of the megalithic sepulchral chambers of the Kentish group.

It is possible that some of the masses of Sarsen stone which occur in various parts of Kent may be remains of sepulchral chambers, but the fact that they also occur naturally on the surface of the ground makes it practically impossible to determine the point.

There seems good evidence that a sepulchral chamber of the character described above once existed near Cobham Church. In or about the year 1830 Mr. F. C. Lukis¹ observed remains of it, but unfortunately the structure had been destroyed and only one large stone, too heavy to carry away, had been suffered to remain.

MAPLESCOMBE. In the ruined church of Maplescombe, not far from Dartford, there are four Sarsen stones in a position which suggests artificial arrangement, but of course it does not follow that they are connected with the megalithic remains for which the more central part of the county is famous.

Two interesting pieces² of neolithic pottery have recently been found in Mid-Kent, both of which are now in the Maidstone Museum. One, $4\frac{1}{2}$ in. diam. and $2\frac{1}{2}$ in. high, was found at Maidstone; the other, 3 in. diam. and $2\frac{1}{2}$ in. high, was procured at Rose Wood, Ightham.

THE BRONZE AGE

There can have been but few, if any, more important prehistoric events than the discovery of metals. Bronze, which is known to have been in use long before iron, although inferior to the latter in certain qualities, possessed many valuable properties, which were lacking in flint and other hard substances which had been employed hitherto.

¹ *Journ. Brit. Arch. Assoc.* ix. 427.

² *Arch. Cant.* xxvii. pp. lxxvi-lxxviii.



MEGALITHIC REMAINS, ADDINGTON.



MEGALITHIC REMAINS AT COLDRUM, TROTTISCLIFFE.

EARLY MAN

The possibility of shaping it whilst in a state of fusion, and of re-sharpening implements made of it, gave to metal tools an immense superiority over those fashioned out of stone; and it is practically certain that the introduction of the new material had the effect of revolutionizing the methods of warfare, hunting, husbandry, building and other crafts. The introduction of bronze into Britain is associated with the appearance of the Goidels.

In the entire absence of documentary evidence, it is unwise to speculate in reference to certain phases and sides of life in the Bronze Age. We have simply the remains of weapons, implements, pottery, ornaments, etc., scattered on the surface of the ground, or hidden beneath its surface, either in the form of a secret hoard or a sepulchral deposit; we have evidences of decorative art on pottery and metal-work; we have earthworks built up by man during the Bronze Age; and, finally, we have bones of Bronze Age man himself.

From these various sources it can be pretty clearly shown that the Bronze Age extended over a comparatively long period of time. During that period there was a considerable advance in husbandry, in the potter's art, and indeed in the various phases of civilization generally. When the bronze-using people came to what is now England, they came probably as traders. At any rate, they soon fraternized with the neolithic inhabitants, and there is strong evidence that the two races intermarried. The testimony of sepulchral deposits upon this point is of great value, because it clearly establishes the fact that sepulture by inhumation, which was the special feature of neolithic burials, survived through the Bronze Age.

The distribution of Bronze Age antiquities in Kent, whether articles composed of bronze, or pottery, or personal ornaments, affords confirmatory evidence of these peaceable relations between the two races. Aylesford, which is remarkable as having afforded antiquities of every period of prehistoric times, is one of several localities in Kent where Neolithic and Bronze Age people lived side by side.

The chief antiquities of the Bronze Age in Kent have been discovered in or near the river-valleys of the Medway and the Stour, and also on or near the sea-coast, as in the Isle of Harty, and between Margate and Dover. The two forms of implements usually associated with the early part of the Bronze Age are the broad-edged flat celts and the short knife-daggers. An example of the former has been found at Aylesford,¹ and of the latter at Sittingbourne²; but these types are distinctly rare in Kent.

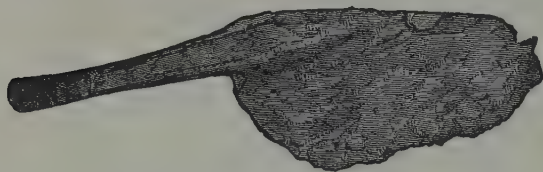
The implements or weapons suggestive of a later period are, however, much less rare, and the following are the more important examples: Swords have been found at All Hallow's, Hoo; Chatham; and the Thames at Greenwich: spear-heads at Chartham and Saltwood: a fine bronze shield in the Thames near Woolwich: knives at

¹ *Proc. Soc. Antiq.* xvii. 376-7.

² *Op. cit.* x. 29.

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All Hallow's, Hoo, and the Isle of Harty : a sickle at Marden : celts at All Hallow's, Hoo ; Canterbury ; Dover ; Minster (Thanet) ;



BRONZE KNIFE FROM ISLE OF HARTY.

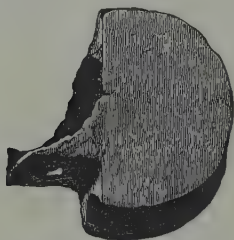
Sittingbourne ; Wateringbury ; and Wye : palstaves at All Hallow's, Hoo ; Ashford ; Blean ; Buckland (near Dover) ; Chatham, etc. ; whilst skinning-knives, pins, rings, and numerous other miscellaneous objects, have been recorded from Marden and the more important bronze hoards in the county.

Hoards of bronze, comprising rough masses of metal, or old, broken or worn-out implements, are of the highest archæological value, because they furnish important evidence as to the working of metal in prehistoric times, and help to indicate the extent and direction of trading operations, the purposes and uses of the tools and implements of man in the Bronze Age, and other equally interesting subjects.

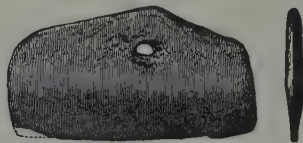
Kent has furnished six or seven examples of hoards of this kind, some of them being remarkable for their numerous and varied contents. The following are succinct particulars of the more important Kentish hoards :—

ALL HALLOW'S, HOO. In 1873 some agricultural labourers found at Home Wood Farm a hoard containing eighteen objects, mainly socketed and looped celts, a knife, a sword-hilt, and a very rare form of skinning knife, and composed, according to the account given by Mr. Humphrey Wickham,¹ of pure copper. Lumps of metal weighing nearly 8 lb. were found with the implements.

Another hoard was discovered in 1875 about 3 ft. below the surface of the ground at Little Coombe Farm,² on the border of the parishes of All Hallow's and St. Mary, also in the Hundred of Hoo. It consisted of twenty-seven objects mostly in the form of broken socketed



SWORD-HILT (DAMAGED) FOUND AT ALL HALLOW'S, HOO.



KNIFE FOUND AT ALL HALLOW'S, HOO.

celts. These articles, weighing in all $7\frac{1}{2}$ lb., were accompanied by lumps of unmanufactured metal of about an equal weight. The implements, as in the case of the earlier find, are said to have been composed of pure copper.

EBBS FLEET, MINSTER, THANET. A bronze hoard of great importance was found here in January 1893.³ It contained upwards of 190 separate implements, and fragments of bronze, and weighed 160 lb. or more. The chief contents were portions of dagger, swords, and celts, and perfect examples of socketed celts, palstaves, spear-heads, sickle, hammer, and

¹ *Arch. Cant.* xi. 124-5.

² *Op. cit.* 123-4.

³ *Proc. Soc. Antiq.* (ser. 2) xiv. 309-11, and xv. 138.

EARLY MAN

knives, as well as numerous lumps of bronze or copper. The knives, two in number, consisted of an example of the rare kind of skinning-implement found in the Home Wood Farm hoard just described, and a specimen of a socketed knife with a single rivet hole and lacking the point. There was one other object found which is worthy of mention, namely a pierced disc with short tube, resembling that found in the Isle of Harty hoard and figured by Sir John Evans in his well-known work on bronze implements, etc.¹

HARTY, ISLE OF. This important hoard has been well described by Sir John Evans² as 'the stock-in-trade of an ancient bronze founder.' It contained celt moulds and the celts made in them, a gouge-mould, gouges, hammers, knives, etc., but the great importance of the discovery arises from the valuable information it gives as to the methods adopted in casting bronze rather than in the number or character of the particular objects of which the hoard consisted. The largest mould was made in two pieces, each of which was furnished on the outside with projecting pins. The purpose of these pins was to hold in position the cords by which the two halves of the mould were bound during the process of casting. Five celts produced in this mould were found in the hoard, yet no two were actually alike, and from a careful study of the different specimens it appears that the system of casting adopted was as follows :—

First, the mould was tied together in proper position, and loam or clay was rammed into it so as to tightly fill the upper part. Secondly, the mould was taken apart, and the clay removed and probably left to become nearly dry. Thirdly, the lower part of the clay was then trimmed to form the core, a shoulder being left which would form the mould for the top of the celt. The upper part of the clay would be left untouched, beyond having two channels cut in it to allow of the passage of the melted metal. Fourthly, the mould would be tied together again with the prepared core inside, the untrimmed part of which would form a guide for its due position in the mould. Fifthly, the mould would then be placed vertically, probably by being stuck into sand, and the melted metal would be poured down the channels.³ Another explanation of the slight variations in the sharpness of the mouldings is as follows. In order to prevent the molten bronze from adhering to the bronze mould, the latter must have been smeared over with something by way of protection, so as to form a thin film between the metal of the mould and that of the casting. It is probable that the ancient bronze founders used a thin coat of marl to prevent contact of the metals, and the variations in the thickness of the protecting film have been reproduced in the form of the implement.

The Isle of Harty hoard contained some other implements, two pieces of copper, and a whetstone, and is in every way important as showing what were the tools and methods of a primitive bronze founder.

LEEDS. A letter from Dr. J. Young to Dr. Thorpe, dated 9 November, 1708, describes the discovery near Leeds Castle of about sixteen 'boltheads such as the Romans used to shoot from y^e catapultæ.' Several of these were sold to a brazier, but two apparently were sent to the Royal Society for exhibition. It is probable that this was a hoard of bronze celts or palstaves, but from the imperfect record given in the letter it is impossible to say more. The original letter is preserved among the manuscripts belonging to the Society of Antiquaries of London (No. 202, fol. 162).

MARDEN. In some ways this is the most remarkable of the Bronze Age hoards of Kent. This part of the Wealden area is hardly one where such a deposit might be expected, yet it should be borne in mind that a metallic hoard of this early period was essentially a secret deposit, and it is conceivable that its presence here does not necessarily imply that the district was much frequented during the period to which the hoard is ascribed. There is some reason to think, however, that the deposit may be ascribed to a late period in the Bronze Age, from the fact that a tool probably of Late Celtic character was found in it. The hoard was contained in an earthen vessel, and the objects of which it was composed were mostly broken.⁴ One of the articles found was a bronze sickle.

SALTWOOD, USUALLY KNOWN AS THE HAYNES HILL HOARD. This hoard⁵ was found in or about the year 1873 during the progress of the works connected with the construction of the Hythe and the Sandgate Railway. It consisted of a part of a lance- or spear-head, with an interesting series of ring ornaments engraved on the blade, the chape of a sword of pouch-

¹ Fig. 503, p. 403.

² See Evans, *Bronze Imp.* 443-4.

³ *Arch. Journ.* xxx. 279. *Journ. Anthropol. Inst.* iii. 230.

⁴ *Op. cit.* 442.

⁵ *Journ. Brit. Arch. Assoc.* xii. 257.

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like form, celts mostly broken, swords, daggers, lance-heads, gouges, etc., and some rude ingots of copper. It is of interest to note that a flint arrow-head was found with the hoard.

SITTINGBOURNE. This hoard¹ consisted of four socketed celts, one socketed gouge, and about 30 lb. of copper; these were found in one urn. Another urn contained broken swords and rings.

The above are the more important hoards of Kent, and although there are on record other discoveries of Bronze Age antiquities in different parts of the county, the hoards are specially valuable from the fact that they give us precisely the kind of information we require in attempting to understand what were the occupations, industries, and modes of life of the Bronze Age people of Kent. An analysis of their contents enables us at once to see that the general characteristics of the objects found point to a late rather than an early part of the Bronze Age, and it may be inferred, therefore, that Kent retained its neolithic influences and traditions until a comparatively late period, an inference which is in agreement with the importance of the neolithic race of Kent as shown by its megalithic structures, its camps, its dwellings, and its implements.

Another point which seems to be fairly well established by the preponderance of implements of husbandry, etc., over those intended for fighting purposes, is that the inhabitants of Kent during the Bronze Age were artificers, craftsmen, and tillers of the soil rather than people of warlike character.

Pottery of the Bronze Age was made by hand without the assistance of the potter's-wheel. It was of two kinds, the first being plainly and strongly made and evidently intended for culinary purposes, whilst the second was considerably enriched with ornament, and intended for sepulchral purposes. Kent has recently furnished two or three examples of this kind of pottery, known as 'drinking cups.'

In a pit near Erith where gravel was being dug, a fall of earth from the side of the pit revealed sepulchral urns standing in small cavities 3 ft. below the surface and 5 ft. apart. The urns, which are tastefully and rather richly ornamented with parallel horizontal lines, relieved in the case of one pot by upright lines in three bands, are now in the possession of Mr. W. M. Newton, by whose courtesy the accompanying photographs are published.

Another urn of the Bronze Age, richly ornamented in a style which comprises more of the commoner zig-zag decoration, was found in 1900 close by the highway leading from Canterbury to Littlebourne, and is now in the possession of Mr. F. Bennett Goldney, F.S.A., by whom it was exhibited at a meeting of the Society of Antiquaries.²

The sizes of the two urns found near Erith are—height $5\frac{1}{2}$ in. and $5\frac{1}{4}$ in. respectively, and in diameter of mouth 4 in. and $3\frac{3}{4}$ in. respectively.

The Canterbury example is slightly smaller, being $4\frac{1}{2}$ in. high and $4\frac{1}{4}$ in. across the mouth. The richness of its decoration indicates that it was sepulchral pottery.

¹ *Proc. Soc. Antig.* x. 29; *Arch. Journ.* ii. 81; *Coll.* i. 101.

² *Proc. Soc. Antig.* (ser. 2), xviii. 279.



Bronze Celt from the
Isle of Harty.



Urn from Canterbury.



Bronze Celt from
Canterbury.



Bronze Palstave from Chatham.



Urn from Erith.



Urn from Erith.

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Ornamentation, especially when freely used, as in the case of these three pots, is generally considered to be the chief distinguishing mark of sepulchral as opposed to culinary pottery of this period.

The Bronze Age method of burial was probably accompanied by cremation, but it is pretty certain that the earlier neolithic custom of inhumation survived among certain tribes or families throughout the Bronze Age. It also seems highly probable that the burial of pottery with the cremated remains of Bronze Age folk may have been a custom borrowed from the neolithic races.

There are good reasons to believe that as far as Kent is concerned the Bronze Age, especially in its latter part, was a period characterized by considerable wealth and refinement. The remarkable ornaments composed of pure gold, to which reference will now be made, may not indeed represent exactly the same degree or proportion of wealth which they would have at the present time because the standards of metallic value are doubtless different; but they certainly may be regarded as evidence of refinement and appreciation of the beautiful.

The fact that gold occurs in some places naturally in a pure state has led to the inference that this was the first metal discovered by man.¹ In view of this, and also taking into consideration the ease with which natural gold may be shaped, it is a very difficult task to pronounce upon the age of objects of gold unless one is aided by some characteristic form or ornamentation upon them.

Among the antiquities of gold found in Kent, however, there are some which may undoubtedly be referred to the Bronze Age. In 1861 three armlets and a trumpet-shaped object, perhaps part of a fourth armlet, or possibly a portion of a mammillary fibula, were found in the Medway,² below Aylesford. Each armlet weighs somewhat over 2 oz., and has been formed by hammering. One is quite plain, another is slightly ornamented, and the third is rather elaborately marked with ornament of characteristic Bronze Age form. Fortunately these gold ornaments belong to the Kent Archæological Society, and are preserved at Maidstone.

Another armilla formed of four pieces of solid gold wire, and weighing altogether upwards of 2 oz., was found at Canterbury³ in 1860. The wire was clearly made by hammering and not by drawing, as its form is thick in the middle and tapering towards the ends, where they are welded together.

No less than seven examples of gold armillæ were subsequently discovered in the Aylesford district, and they were described and figured by Mr. C. Roach Smith, F.S.A. in *Archæologia Cantiana*.⁴ From the accompanying engravings, which have been courteously lent by the Kent Archæological Society, the general character of these interesting objects can be gathered, but it is unfortunate that the precise details as to the localities of all the finds are not given. The larger twisted ornament is

¹ Evans, *Bronze Imp.* 418.

² Op. cit. v. 43-4.

³ *Arch. Cant.* v. 41-2.

⁴ *Arch. Cant.* ix. 1-11.

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obviously a torques: its length is 16 in., and its weight nearly 5 oz. The shorter and thicker object decorated with faint lines spirally arranged, weighs considerably more than 5 oz. There can be no doubt that Kent is particularly rich in prehistoric objects of gold.

At Sissinghurst, Cranbrook, a gold finger ring was found in 1868.¹ It was formed of two gold wires twisted. One of the wires is thin and uniform throughout, whilst the other is considerably thicker in the middle and tapers towards each end. It is possible that this may be of the Roman period, but the type to which it belongs is clearly Celtic.

THE EARLY IRON AGE.

The introduction of iron into these islands, affording a material which had great advantages over bronze, particularly in the qualities of hardness, suppleness, and in the capability of taking a keen edge, must have marked a distinct advance in every department of human industry, although there are clear indications that it did not immediately supplant bronze.

The Prehistoric Age of Iron was terminated when the Roman occupation was established, but its commencement is much less clearly defined. It is probable that the Brythons, by whom iron was brought, came gradually to our shores, and introduced the new metal on commercial lines just as the Goidels had brought bronze at an early period. Brythons and Goidels were both branches of the Celtic family, and there is little to indicate that their relations were other than friendly. The presence of Iron Age camps, however, indicates that kind of competition which is incident to a large population.

At any rate it is clear that the substitution of iron for bronze was a gradual process, the latter being used for personal ornaments, horse trappings, etc., throughout the whole of this period and also during the time of the Roman occupation, and, indeed, long subsequently.

Authorities differ even as to the approximate date of the introduction of iron.

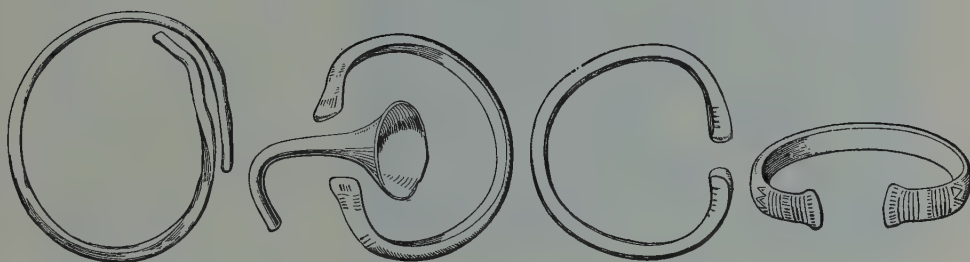
A most important discovery of antiquities belonging to this period was made at Aylesford in 1886, and has been fully and ably described by Dr. Arthur J. Evans, F.S.A., in the pages of *Archæologia*.² During certain excavations in the pit belonging to Messrs. Silas Wagon and Sons, where sand and gravel are procured, several earthen and metallic objects were discovered, including a pail, a jug, a long-handled pan and two brooches, all of bronze, also some earthenware of elegant form and of a peculiar style of manufacture which Dr. Evans assigned to Gaulish and North Italian influence. These objects were found in what had been a round burial pit about $3\frac{1}{2}$ ft. deep, and from further data procured subsequently it appeared that pits of this kind, each

¹ *Arch. Cant.* ix. 12.

² On a Late-Celtic Urn-field at Aylesford, Kent, and on the Gaulish Illyro-Italic and Classical Connexions of the Forms of Pottery and Bronzework there discovered (*Arch.* lii. 315-88).



GOLD ARMILLA FOUND AT CANTERBURY.



GOLD ARMILLÆ, ETC., FOUND AT AYLESFORD.



BRONZE ARMILLÆ FOUND AT CANTERBURY.

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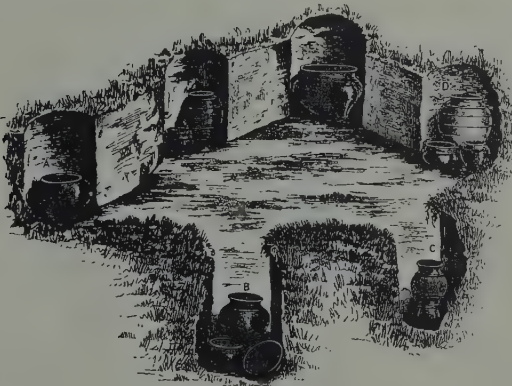
furnished with two or three more urns containing cremated human remains, lay in groups forming more or less irregular circles.

Two sets or types of burials were identified at Aylesford. In the case of the earlier burials, marking a period before continental influence set in, the pottery was doubtless of native manufacture, and based on models supplied by Bronze Age examples. In the other type of burials the pottery was clearly made under strong continental influence, and its characteristic forms and ornamentations point to intercourse between



GRAVE-PIT, AYLESFORD.

Europe and the Britons. Some may have been imported, but it is more probable that settlers from Gaul, etc., resided at Aylesford. The urns of this second type of burial are pear-shaped, pedestalled, cordoned, and zoned, features which Dr. Evans identifies with those of the pottery of the more eastern parts of Gaul and the Alpine and Italic region about the head of the Adriatic Sea. Burials of this second type occurred in the form of irregular circles.



SKETCH-PLAN OF GRAVE-PITS, AYLESFORD.

One of the most important points established by this discovery is the existence of a wholly new style of ancient British ceramic art. Dr. Evans, on this point, writes: 'The handiwork of the British potters of pre-Roman times has been hitherto almost exclusively associated with the coarse-grained hand-made vessels that represent the direct tradition of the cups

and urns of our neolithic barrows. It is now generally recognized that the origin of this ruder class of vessels is to be sought in early

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basket-work, the forms and ornaments of which are reproduced with certain modifications and additions. It is to this older class that, as already observed, some of the pottery in the outlying graves of the Aylesford cemetery is to be referred; but . . . the great bulk of the vases discovered on this site belong to quite another category. In their form, fabric, and colour alike, they betray an altogether different pedigree, and the influence of more classical prototypes. The clay of which these vessels are composed is of finer quality than that of the typical Ancient British pottery. They are mostly free from the grit and cretaceous particles that form so conspicuous a feature in the older class of earthenware from the same site; minute grains of quartz and apparently mica are, however, occasionally in the walls of the pots. They are better baked and occasionally present a uniform pale brick colour, resembling that of some Roman vases. This appearance is however rare, and the internal substance of the pottery is usually of a light brown colour. The difference in the surface is even more marked. This appears in almost all cases to have been originally coated with a black lustrous pigment, formed probably, like that on some contemporary Gaulish vases, of finely pounded charcoal, and when this has worn away the exterior surface is still of a dark brown colour.

‘There can be no doubt that the great majority of these vessels are wheel-turned. In some instances concentric circles appear on the bottom of the pot, and in one case the centre of the base shows a hemispherical concavity like the kick of a bottle.’¹

The bronze objects discovered at Aylesford have been shown by Dr. Evans’ able researches to be of even greater importance than the pottery. The bronze-plated *situla* or pail is ornamented with an upper band of bronze ornamented with *repoussé* work reliefs of fantastic animals and scrolls. The latter, which are of Greek origin, may be compared with forms found in La Tène sheaths, whilst the former are related to animals figured on Gaulish coins. The handle attachments are ornamented with human heads, and from their form it is evident that they are an ornamental outgrowth and survival of a form of attachment usual in the case of a class of early two-handled *situlae*.

Two other bronze vessels were found with the pail at Aylesford: one was a jug, or *oenochaë* with a curious ornament with terminal cross near the point where the handle was attached to the body of the vessel. The other was a beautifully made long-handled pan or *patella*. Both may be regarded as pre-Roman importations from beyond the Alps.

Inside the bronze pail two bronze *fibulae* were discovered, which were probably of the late La Tène period.

Another bronze vessel, which had been discovered at Aylesford and placed in the British Museum before the other objects enumerated were found, was a bronze plated tankard, the model of which was perhaps the tankards or drinking cups of native woodwork rather than the classical or continental forms upon which the other objects were based.

¹ *Arch.* lii. 328.



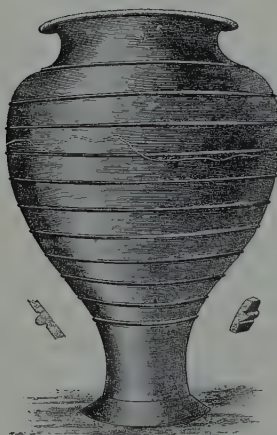
Wooden Pail with bronze mounts.
(About 10 inches high.)



Full-size view of head on pail.



Bronze Flagon.
(About 7½ inches high.)



Cinerary Vase.
(About 15 inches high.)

LATE CELTIC ANTIQUITIES FOUND AT AYLESFORD.

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Dr. Evans, in some general conclusions at the end of his important paper,¹ placed the date of the Aylesford cemetery at about the middle of the first century B.C., and points out that not a single object of purely Roman fabric has been found among the sepulchral remains there.

The Prehistoric Age of Iron witnessed the introduction and development of a style of ornament of peculiar grace and delicacy, known as Late Celtic art. The foliated ornament on the Aylesford pail is in fact particularly interesting as an example of this form of decorative art. Originally the forms seem to have been adapted from those of natural foliage, but in process of time they became conventionalized, and the main idea seems to have been to produce a number of more or less curved trumpet-shaped figures arranged in various combinations.

In the accompanying figure is shown a metal disc found at Greenwich,² which has been ornamented in this way.

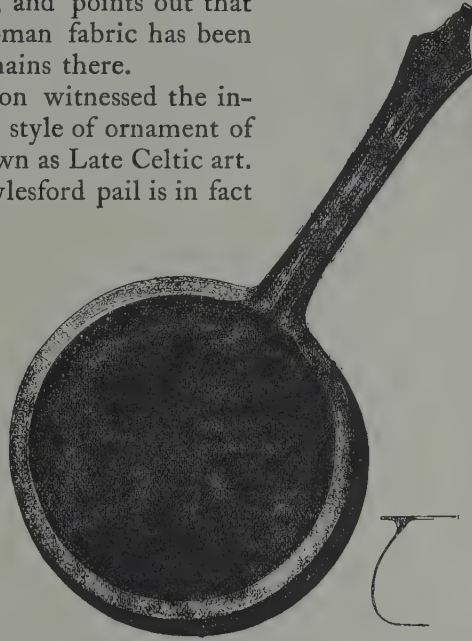
Bronze discs of this character were generally enamelled and applied as decorative mountings to metal bowls, some of which are of the Saxon period. An important article on this subject was communicated in 1898 to the Society of Antiquaries³ by Mr. J. Romilly Allen, F.S.A., in which it is shown that such discs must be referred to the end of the Late Celtic period and the beginning of the Saxon period. Other objects bearing evidence of Late Celtic art have been found at Canterbury, Faversham, Folkestone, Hartlip and Lullingstone.

In the Marden hoard of bronze antiquities already described a torques of Late Celtic character was discovered.



METAL DISC FOUND AT
GREENWICH.

Another important site where antiquities of this age have been procured is Bigberry Hill in the parish of Harbledown. Mr. John Brent,⁴ in the year 1861, communicated to the Kent Archaeological Society an account of certain 'relics apparently Roman' found at that place, comprising a plough-share, coulter, cattle goad, an iron tyre of a plough or chariot wheel, an iron bit, and links or traces. In a letter written to Mr. Charles Roach Smith in 1866 he records



LONG-HANDLED PAN OF BRONZE, AYLESFORD.
(Diameter of pan about $8\frac{1}{2}$ inches.)

¹ *Arch.* lii. 382.

² *Arch.* lvi. 39-56.

³ *Proc. Soc. Antiq.* (ser. 2), ii. 202.

⁴ *Arch. Cant.* iv. 33. *Coll. Antiq.* vi. 261-2.

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the further discovery of four perfect sickles, several iron rings, an engraved bronze buckle, etc. More recent discoveries at Bigberry Hill include numerous antiquities of iron such as sickles, bill hooks, hammers, chains, etc., of a character which pretty clearly indicates that they may be referred to the Prehistoric Age of Iron.

In a paper read before the Royal Archæological Institute in 1902, Professor Boyd Dawkins¹ shows that this camp 'falls into line with a series of settlements of Prehistoric Iron Age, such as Mount Caburn explored by the late General Pitt-Rivers, the Lake Village of Glastonbury explored by Mr. Bulleid, and Hunsbury, the remains from which are preserved in the museum at Northampton. They are pre-Roman, and probably belong to a period ranging from one to two centuries before the invasion of Britain by Cæsar.'

From the relation of this camp or settlement to the Pilgrims' Way which passes through it, it is pretty clear that the road is as ancient as the earthworks.

As the various ancient earthworks of Kent will be dealt with in a separate section it is unnecessary to describe the camp more fully.

COINS OF THE ANCIENT BRITONS.

The chief names inscribed on the British coins of Kent are those, usually in abbreviated form, of Eppillus, Dubnovellaunus and Vosenos,² who were probably rulers of Kent or parts of Kent. Of the first-named prince there are a good many copper coins. It was formerly believed that they were confined to the Kentish district, but a few examples have been found elsewhere. There are two types of inscribed gold coins of Dubnovellaunus. Most of the coins, however, are uninscribed.

Perhaps the most remarkable feature about the Kentish coinage at this early period consists in the employment of the metal tin, or rather an alloy largely composed of tin. These coins are rather roughly cast and show little if any attempt at ornament. The usual device on the obverse is a rude and weak representation of a helmeted head in profile, and on the reverse the figure of a bull. Two hoards of these coins have been found at Birchington, and individual specimens have been found at Lenham Heath, and by the writer on the sea beach at Deal.

The coins found at Reculver, consisting of three uninscribed pieces and one each of the coins of Cunobelinus, Tasciovanus, and Addedomaros respectively present a richness of variety which is noteworthy. At Boughton Monchelsea too, a parish near Maidstone, have been found coins of Dubnovellaunus, Cunobelinus and Amminus; whilst from Aylesford parish, at or near Kits Coty House, three coins are recorded—one of Eppillus, one of Amminus, and one uninscribed. At Canterbury was found some years ago a brass or copper coin of consider-

¹ *Arch. Journ.* lix. 211-18.

² The form of this name is not precisely known. Possibly, as Sir John Evans has suggested, the full name may have been VOSILLAVNOS, or VOSSELLAVNOS.

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able thickness, which Sir John Evans pronounces to be of undoubtedly Gaulish type.

In conclusion, attention may be called to the diffusion of the coins of two of the kings of the Kentish district. Those of Eppillus have been recorded from Ash-next-Sandwich, Aylesford, Bapchild, Birchington, Margate, and Sittingbourne; whilst those of Dubnovellaunus have been found at Boughton Monchelsea, Canterbury, Frindsbury, Gravesend, and Ramsgate.

BARROWS AND TUMULI

The following list of barrows and tumuli in Kent includes remains which may very possibly be of post-Roman as well as pre-Roman date. As only a comparatively small proportion have been excavated and examined it is impossible to make any satisfactory classification, and it has been considered more convenient, therefore, to include in this list, as far as possible, all Kentish barrows and tumuli.¹

- ALDINGTON.—A large tumulus known as Aldington Knoll, and another mound called Roman Beacon.
- APPLEDORE.—On the high land about half a mile north of the town is a much mutilated tump of earth, marked on maps Mill Hill. Though a windmill may have occupied the summit it is not likely that it was necessary to throw up earth for such a building, and we must consequently include the mount among the tumuli of Kent.
- BARHAM.—There is a very large number, estimated by some at over 300, of barrows on Barham Downs and Breach Downs. [See Hasted's *Hist. of Kent*, iii. 752-53.]
- BISHOPSBOURNE.—Large tumulus, said to contain stone cists, in Gorsley Wood.
- BLACKHEATH.—Two tumuli, known as (1) Mortar Mount, and (2) Jack Cade's Mount.
- BRIDGE.—Three tumuli in Gorsley Wood.
- CHARTHAM.—Numerous barrows (possibly Anglo-Saxon) on Chartham Downs, now ploughed up.
- DARENTH.—Two tumuli at Green Street Green.
- DARTFORD.—Numerous tumuli on Dartford Heath; also one tumulus in Joyden's Wood.
- EASTRY.—Two tumuli to the east of earthwork at Shingleton.
- ERITH.—Tumulus in Abbey Wood, also another to the south of West Heath and Lesness Park.
- EWELL.—Tumulus.
- EYTHORNE.—Large barrow or tumulus near Eythorne Court.
- GREENWICH PARK.—About 30 tumuli.
- GUSTON.—One tumulus on Famine Down; site of another to the east of Guston.
- HOUGHTON.—Tumulus on Whinless Down.
- KINGSTON.—Numerous tumuli.
- LEE.—There is a large tumulus in the grounds of The Cedars.
- LITTLEBOURNE.—Two tumuli in Fishpoolhill Wood.
- LYMINGE.—Tumulus to the north of Brockman's Bushes.
- MINSTER (SHEPPEY).—Tumulus near Borstal Lodge.
- NEWINGTON-NEXT-HYTHE.—Tumulus.
- RINGWOULD.—Sepulchral tumuli on Free Down.
- RIVER.—Several tumuli on a hill on north side of the London Road.
- ST. MARGARET-AT-CLIFFE.—Tumulus on Bay Hill.
- ST. PETER'S, THANET.—Two barrows near North Foreland, popularly known as Hackedon Banks.
- SALTWOOD.—Tumulus.
- SNODLAND.—Remains of a large barrow close by the hamlet of Holborough.
- SOUTHFLEET.—Tumulus.
- STOCKBURY.—Tumulus close to South Street.
- STOWTING.—Tumulus on Swinyard Hill.

¹ Partly from information supplied by Mr. I. Chalkley Gould, F.S.A.

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TEYNHAM.—Tumulus on site of a defensive work (now obscure) known as Newlands.

THORNHAM.—Two tumuli.

WEST WICKHAM.—Three or four tumuli near the earthworks on West Wickham Common.

WOMENSWOLD.—Three tumuli on Three Barrows Down.

WOODNESBOROUGH.—This mound, often referred to as a tumulus, is believed to be entirely natural.

WROTHAM.—Large tumulus at Borough Green.

WYE.—Tumulus on Wye Downs.

PREHISTORIC ROADS.

Among the various ancient roads to be found throughout Kent there are some which may be assigned with considerable probability to a pre-Roman period. The narrow road or trackway commonly called the Pilgrims' Way is at once the most important and the most widely known of the series as far as this county is concerned. Unlike the Roman Watling Street which runs from one end of Kent to the other, the Pilgrims' Way follows a course which is determined by the physical features of the country through which it passes. Between the neighbourhood of Canterbury and the point at Chevening in West Kent, where it passes into Surrey, it follows with remarkable persistence the southern slope of the North Downs, and traces of it, more or less perfect, can be seen at many places, running sometimes as a grass-covered way, as at Eastwell Park, at other places as a somewhat hollowed-out roadway overgrown with underwood, or choked up with weeds and rubbish. For a considerable part of its course it serves as a road for farm carts.

To the east of Canterbury the course of the Pilgrims' Way is not precisely indicated, but the probability is that one branch of it was continued to the sea-coast, at or near the Isle of Thanet, and another was continued to Dover. On the west side of Canterbury everything as to its course is quite clear and intelligible. At Harbledown it continues in a nearly due south-westerly direction, the Roman Watling Street branching off and running to the W.N.W. The Pilgrims' Way then runs through the following places :—Bigberry Wood, Hatch Green (Chartham), Chilham, Godmersham Park, Boughton Aluph, Eastwell Park, near Charing, near Lenham, Hollingbourne Hill, Detling, a little to the north of Boxley, just to the south of Blue Bell Hill (near Kits Coty House), and Burham Street. Just beyond Burham Street the old road appears to divide, one part leading northward to Rochester, the other leading westward to about Lower Halling, where, it has been suggested, there may have been a ford across the river Medway.

Corresponding to the branch that leads northwards, along the east bank of the river to Rochester, there is a similar narrow road on the slope of the Downs west of the Medway, running near Cuxton, Upper Halling, and nearly at the foot of the hills past Kentish Drover, a little to the north of Trottiscliffe and Wrotham. Beyond this it runs along the foot of the Downs, passing a little to the north of Kemsing Church and then bearing slightly round to the north through Otford, where was a ford across the river Darent. The next point at which it is

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well seen is in Chevening Park, and from that place to the Surrey border, near Betsom's Farm, it is possible to trace its course with considerable precision. In Surrey it passes through Titsey Park, where its course is indicated by a slight depression in the ground. It runs through Surrey and beyond as far as Southampton.

It will be obvious from the above that the Pilgrims' Way is no mere track-way leading from village to village, but an important trade-road extending from the sea-coast on the south to the sea-coast on the east of England. Moreover, it does not connect the Saxon villages of the district through which it passes. It clearly belongs to an earlier system of roadways than those connected with the Saxon civilization. It is also essentially distinct from the Roman roads of the county, which are of a military character, and have been constructed straight across the country from Canterbury to Rochester, Dartford to London, Lympne to Canterbury, Dover to Canterbury, Dover to Sandwich, etc.

It is quite safe to assign the Pilgrims' Way to a pre-Roman period. Professor W. Boyd Dawkins¹ points out that it belongs to the same system of roads which in other parts of Britain are clearly proved to belong to the prehistoric Iron Age. The fact that it passes through a settlement of this period at Bigberry Wood, near Canterbury, and also quite near the late Celtic urnfield at Aylesford, is certainly interesting as evidence that the Pilgrims' Way is as old as the Early Iron Age, but it is in no way opposed to the opinion formed by the present writer that the road is really very much older. As a matter of fact, the question of the antiquity of this ancient way is closely connected with one of the most interesting problems of the prehistoric archæology of Britain.

Much has been written, and many different opinions are held, as to the position of Ictis or Mictis, the points on the sea-coast of Britain, or on an island or islands close by Britain, where the tin was shipped for foreign parts. St. Michael's Mount, Cornwall, and the Isle of Wight² have been suggested by some authorities as the probable ports from which tin was shipped; but there is a good deal to be said in favour of a port situated near a shorter sea passage, and both the Isle of Thanet and Dover answer these requirements. To both ports the Pilgrims' Way afforded a commodious and direct means of communication. As has already been mentioned, east of Canterbury it appears to have been continued to these two points on the sea-coast by two distinct routes.

In the present state of this question, when the identification of Mictis and Ictis are still in doubt, it may be premature or unwise to theorise as to the possibility of Thanet or Dover having been the points where tin was shipped for export. Still, the fact that they mark the eastern terminations of this remarkable roadway is significant, and the suggestion appears to be worthy of consideration.

The possibility of the Pilgrims' Way having been a still earlier thoroughfare is suggested, rather than indicated, perhaps by the manner

¹ *Archæological Journal*, lix. 217-18.

² See an interesting paper on this point by Mr. Clement Reid, F.R.S., in *Archæologia*, lix. 281-8.

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in which it links together the two most important Stone Age monuments of Kent, namely Kits Coty House and Coldrum. The ford across the Medway at Lower Halling must have furnished a practically direct means of communication between these two cromlechs situated upon the southern slopes of the North Downs and within easily visible distance from each other.

Another very early road through Kent appears to have run to the north of the North Downs in a direction corresponding irregularly with the general trend of the Roman Watling Street. It was connected at intervals with the Pilgrims' Way by cross-roads running approximately north and south. Colonel O. E. Ruck, F.S.A. Scot., has drawn the writer's attention to the fact that these prehistoric cross-roads are in several cases connected with prehistoric camps, as, for example, at Bigberry, Cobham, Ightham, and Westerham. The last-named road, indeed, is associated with at least two early earthwork strongholds, namely, that in Squerries Park, Westerham, and the camp at Holwood, Keston.

The remaining traces of prehistoric roads in Kent are not perhaps either numerous or definite. Still there are in places traces of them. Some exist in West Kent, particularly near the neolithic hut-floors at Hayes Common,¹ and on other large spaces of open ground which have never been levelled by cultivation.

TOPOGRAPHICAL LIST OF PREHISTORIC ANTIQUITIES IN KENT.²

- ADDINGTON.—Megalithic remains probably of the Neolithic Age [*Gent. Mag.* Aug. 1824, pp. 111-12; *Reliq.* Oct. 1871; *Arch. Cant.* xiii. 14, 16].
- ALL HALLOW's, Hoo.—Important hoard of twenty-seven bronze objects, mostly spear-heads, palstaves and socketed celts, but comprising also some rare forms [Evans, *Bronze Imp.* 214, 230, 467; *Arch. Cant.* xi. 123-124].
- ASH (near Wrotham).—Palæolithic implements [Evans, *Stone Imp.* 608].
- ASH (near Sandwich).—British coin of Eppillus and Vosenos and one uninscribed [Evans, *Coins*, 50, 191, 207].
- ASHFORD.—Bronze Age palstave now in the Mayer Collection, Liverpool [Evans, *Bronze Imp.* 81, 82].
- AYLESFORD.—Palæolithic implements [Evans, *Stone Imp.* 610]. Neolithic leaf-shaped arrow-head of flint found near Kits Coty House [Evans, *Stone Imp.* 378]. Megalithic remains, probably of the Neolithic Age at Kits Coty House [*Reliq.* Oct. 1871, p. 70, etc.]. Bronze Age graves and flat celt and two knife-daggers [*Proc. Soc. Antiq.* (Ser. 2), xvii. 376-77]. British coins, uninscribed and of Eppillus, and Amminius (?) [Evans, *Coins*, 122, 197, 354]. Gold ornaments of the Bronze Age [*Arch. Cant.* v. 41, 42; and ix. 12].
- BAPCHILD.—British coin of Eppillus [Evans, *Coins*, 197].
- BEXLEY.—Neolithic hatchets, chipped and ground at the edges [Evans, *Stone Imp.* 103; *Arch. Journ.* xlviii. 436]. Neolithic flint knife [Evans, *Stone Imp.* 357]. Eight plain gold penannular bracelets of the late Bronze Age period found together in 1906 in a gravel pit. They are of two sizes, viz, four are broad and hollowed, and four are narrower and flatter on the inside face; all have the terminals thickened into a semicircle. Total weight, 24 ozs. 8 dwt. 6 gr. They have been purchased as treasure-trove for the British Museum [information kindly supplied by Mr. Reginald Smith, F.S.A.].
- BIRCHINGTON.—British coin of tin, uninscribed gold coin, and one Eppillus [Evans, *Coins*, 51, 125, 194, 484].
- BLEAN.—Bronze palstave found by Mr. John Brent [Evans, *Bronze Imp.* 88].

¹ *Archæologia Cantiana*, xiii. 16.

² Where references are not given the discovery has been made by the writer, or the information has been communicated to him privately.

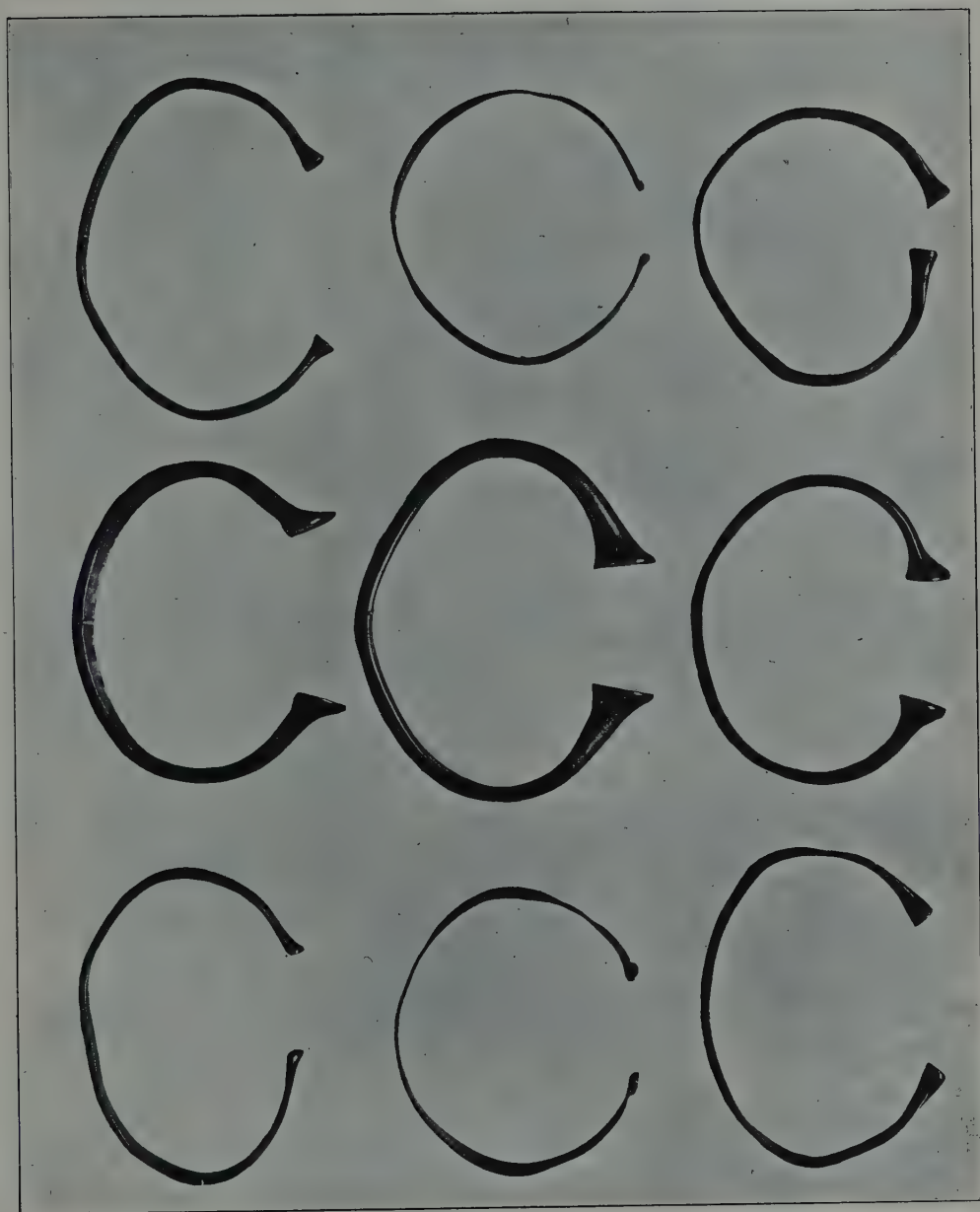
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- BOUGHTON MONCHELSEA.**—British coins, uninscribed, and of Amminus, Cunobelinus, and Dubnovellaunus [Evans, *Coins*, 111, 211, 324, 350].
- BOXLEY.**—Uninscribed gold coin [Evans, *Coins*, 51].
- BROADSTAIRS.**—Numerous neolithic implements and sites of factories of implements. Uninscribed gold coin [Evans, *Coins*, 65].
- BUCKLAND** (near Dover).—Bronze palstaves now in the Mayer Collection, Liverpool [Evans, *Bronze Imp.* 88].
- CANTERBURY.**—Palæolithic implements [Evans, *Stone Imp.* 618]. Neolithic implements: arrow heads found at Bigberry Hill [Evans, *Stone Imp.* 389]; finely ground celt found at Bigberry Hill [Evans, *Stone Imp.* 102]; roughly chipped celt or hoe [Evans, *Stone Imp.* 70]; flint flakes found in association with a flat bronze arrowhead [Evans, *Stone Imp.* 279]. Socketed celt [Evans, *Bronze Imp.* 114]. Tanged bronze chisel now in Mayer Collection, Liverpool [Evans, *Bronze Imp.* 168]. Socketed bronze gouge¹ [*Min. Soc. Antiq.* 17 June, 1784]. Bronze Age Urn found in 1900 [*Proc. Soc. Antiq.* (Ser. 2) xviii. 279]. Gold ornaments of the Bronze Age [*Arch. Cant.* v. 43-44]. British coins, uninscribed, of copper, and silver of Dubnovellaunus [Evans, *Coins*, 122, 203, 204, 478, 482, 527].
- CHARTHAM.**—Bronze spear-head, 6 in. long, with loops [Evans, *Bronze Imp.* 322].
- CHATHAM.**—Palæolithic implements [Evans, *Stone Imp.* 611]. Neolithic celt of sandstone and another fine example of flint, in Maidstone Museum. Bronze palstave found in Chatham Dockyard [Evans, *Bronze Imp.* 74]. Bronze palstave found at Chatham Hill, now in the Mayer Collection, Liverpool [Evans, *Bronze Imp.* 83].
- CHILHAM.**—Palæolithic implement [Evans, *Stone Imp.* 620].
- CHISLET.**—Neolithic flake of flint much worn by use [Evans, *Stone Imp.* 291].
- CLIFFE-AT-HOO.**—Uninscribed British gold coin [Evans, *Coins*, 435].
- COBHAM.**—Palæolithic implement [Evans, *Stone Imp.* 611].
- COLDHAM.**—See TROTTISCLIFFE.
- CRAYFORD.**—Palæolithic implements and site upon which implements were manufactured [Evans, *Stone Imp.* 606-607; *Arch. Journ.* xxxvii. 294-299; *Journ. Anthropol. Inst.* xiii. 109-118].
- CUDHAM.**—British coin of Cunobelinus [*Arch. Cant.* v. 331; Evans, *Coins*, 559].
- CUXTON.**—Palæolithic implements of tongue-like form [*Arch. Cant.* xxv. lxvii.].
- DARTFORD.**—Palæolithic implements [Evans, *Stone Imp.* 605]. Neolithic earthworks and implements [*Arch. Cant.* xviii. 307 et seq.]. Hut-floors [*Arch. Cant.* xviii. 309].
- DEAL.**—British uninscribed gold coin [Evans, *Coins*, 433]. British coins of tin.
- DOVER.**—Neolithic celt, partly ground [Evans, *Stone Imp.* 91]. Bronze celt (flanged) now in the Mayer Collection, Liverpool [Evans, *Bronze Imp.* 52]. British uninscribed silver coin [Evans, *Coins*, 465].
- EBBS FLEET.**—An important hoard of eighty-one bronze objects [*Proc. Soc. Antiq.* (Ser. 2) xiv. 319, and xv. 138].
- ELTHAM.**—Uninscribed British gold coins [Evans, *Coins*, 52, 63, 64].
- ERITH.**—Palæolithic implements [Evans, *Stone Imp.* 607]. Two earthen urns of the Bronze Age. British uninscribed gold coin [Evans, *Coins*, 51].
- FARNBOROUGH.**—Palæolithic implements. British uninscribed gold coin resembling the type figured by Sir John Evans as C. 9.
- FAVERSHAM.**—British coin of Cunobelinus [Evans, *Coins*, 560].
- FOLKESTONE.**—Palæolithic implements [Evans, *Stone Imp.* 621]. Neolithic celt [*Arch. Cant.* xxii. lii.].² Neolithic implements and probably settlement [Evans, *Stone Imp.* 281]. Uninscribed British gold coin [Evans, *Coins*, 64].
- FRINDSBURY.**—British coin of Dubnovellaunus [Evans, *Coins*, 529].
- GILLINGHAM.**—Rude palæolithic implements [Evans, *Stone Imp.* 611].
- GRAVESEND.**—British coins uninscribed and of Dubnovellaunus [Evans, *Coins*, 50, 63, 204].
- GREENWICH.**—Metal disc with late Celtic ornamentation [*Proc. Soc. Antiq.* (Ser. 2) ii. 202].
- HALSTEAD.**—(Green Street Green).—Several palæolithic implements [Evans, *Stone Imp.* 604-605].
- HARBLEDOWN.**—Bigberry Hill. Camp of the Early Iron Age [*Arch. Cant.* iv. 33; *Coll. Antiq.* vi. 261-2; *Arch. Journ.* lix. 211-18].

¹ In addition to this gouge, which was of regular Bronze Age type, a curious bronze axe in the form of a bull was discovered. This was probably not made in Britain, and may be later than the Bronze Age (see *Bibl. Top. Brit.* vol. i.).

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- HARRIETSHAM.—British uninscribed gold coin [Evans, *Coins*, 52].
- HARTLIP.—Rude palæolithic implement [Evans, *Stone Imp.* 611]. Stone hatchet found in 1838 [*Min. Soc. Antiq.* 7 March, 1839].
- HARTY, ISLE OF.—An important hoard of bronze objects, affording a typical example of the stock-in-trade of a bronze founder [Evans, *Bronze Imp.* 110, 111, 174, 177, 181, 186, 211, 214, 308, 403, 441, 442, 453].
- HAYES.—Numerous neolithic hut-floors, village enclosures, and flint implements [*Proc. Soc. Antiq.* (Ser. 2) xii. 258–64, etc.].
- HERNE BAY.—Numerous palæolithic implements [Evans, *Stone Imp.* 613, etc.].
- HOLLINGBOURNE.—British uninscribed gold coin [Evans, *Coins*, 67].
- HORTON KIRBY.—Palæolithic implement now in Jermyn Street Museum, London [Evans, *Stone Imp.* 607].
- IGHTHAM.—Numerous palæolithic implements found by Mr. B. Harrison and others [Evans, *Stone Imp.* 608; *Arch. Cant.* xv. 91–99; *Journ. Anthrop. Inst.* Feb. 1892, pp. 246–70; *Quart. Journ. Geol. Soc.* May 1889, pp. 270–97, etc.]. Numerous palæolithic and neolithic flakes and implements are now in the Maidstone Museum. Neolithic urn [*Arch. Cant.* xxvii. pp. lxxvii–lxxviii]. Uninscribed gold coins [Evans, *Coins*, 435, 436; *Arch. Cant.* xxii. 51].
- KEMSING.—Part of neolithic hoe found at Childs Bridy in Maidstone Museum.
- KESTON.—Neolithic implements and site of implement factory at Millfield [*Proc. Soc. Antiq.* (Ser. 2) xvii. 216–21].
- KINGSDOWN.—Neolithic celt [Evans, *Stone Imp.* 139].
- KITS COTY HOUSE.—See AYLESFORD.
- LEEDS.—Neolithic scraper [Evans, *Stone Imp.* 309]. Hoard of Bronze Age implements [*Soc. Antiq. MSS.* No. 202, fol. 162].
- LENHAM.—Palæolithic implement [Evans, *Stone Imp.* 618]. British coins of tin [Evans, *Coins*, 125].
- LEWISHAM.—Palæolithic implements [Evans, *Stone Imp.* 604].
- LINTON.—Numerous neolithic arrow-heads now in Maidstone Museum. British uninscribed gold coins [Evans, *Coins*, 431, 441].
- LULLINGSTONE.—Palæolithic implement [Evans, *Stone Imp.* 608].
- MAIDSTONE.—Neolithic urn [*Arch. Cant.* xxvii. pp. lxxvi–lxxvii].
Neolithic implements, some of flint and some of Kentish Ragstone [Evans, *Stone Imp.* 281, 353]. British uninscribed coins of gold [Evans, *Coins*, 62, 68, 95, 435, 440, 562].
- MAPLECOMBE.—Megalithic (?) remains in church.
- MARDEN.—Palæolithic implement [Evans, *Stone Imp.* 610]. Important hoard of Bronze Age and late Celtic objects [Evans, *Bronze Imp.* 198, 208, 211, 308, 366, 381, 388, 450, 467].
- MARGATE.—British coin of Eppillus [Evans, *Coins*, 192].
- MEDWAY RIVER, near Chatham.—Two bronze swords [Evans, *Bronze Imp.* 280, 281].
- MEOPHAM.—Palæolithic implements [Evans, *Stone Imp.* 611].
- MILTON (near Sittingbourne).—Neolithic flint knife and floors of dwellings found at Grove-hurst [Evans, *Stone Imp.* 310, 311; *Arch. Cant.* xiii. 122–26, etc.].
- MINSTER, THANET.—Palæolithic implement [*Reliq.* Jan. 1901]. Socketed bronze celt, now in the Mayer Collection, Liverpool [Evans, *Bronze Imp.* 129]. See also Ebbs Fleet. British uninscribed gold coin [Evans, *Coins*, 433].
- MOLASH.—Palæolithic implements [Evans, *Stone Imp.* 612]. British coin of Vosenos (?) [Evans, *Coins*, 207].
- NEWINGTON (near Sittingbourne).—Palæolithic implement 5 in. long [Evans, *Stone Imp.* 611]. Neolithic celt [*Arch. Cant.* xxiv. 59].
- NORTHBOURNE.—British uninscribed gold coin [Evans, *Coins*, 54].
- NORTHFLEET.—Palæolithic implements [*Journ. Anthrop. Inst.* xiii. 109–18]. British uninscribed gold coin [Evans, *Coins*, 51].
- NURSTED.—Palæolithic implements [Evans, *Stone Imp.* 611].
- OFFHAM.—Palæolithic implement, now in Maidstone Museum.
- ORPINGTON.—Palæolithic implement [*Quart. Journ. Geol. Soc.* lvii. 98].
- OSPRINGE.—Palæolithic implement [Evans, *Stone Imp.* 611]. Uninscribed gold coin [Evans, *Coins*, 432].
- PLUMSTEAD.—British uninscribed gold coin [Evans, *Coins*, 432].
- RAMSGATE.—Neolithic arrow-heads [Evans, *Stone Imp.* 389]. Numerous neolithic implements.



GOLD BRACELETS FOUND AT BEXLEY: FIRST HOARD.

($\frac{2}{3}$ Full Size.)

EARLY MAN

- Bronze Age remains [*Arch. Cant.* xviii. 1 et seq., also xxii. 51]. British coin of Dubnovellaunus [Evans, *Coins*, 204].
- RECVLVER.—Numerous palæolithic implements found on the sea-shore here [Evans, *Stone Imp.* 613-17, 642, etc.]. Some of these are in the Jermyn Street Museum, London. Neolithic flakes [Evans, *Stone Imp.* 283]. (See also Herne Bay.)
- British coins, uninscribed and of Tasciovanus, Cunobelinus, and Addedomaros [Evans, *Coins*, 87, 98, 234, 304, 371, 462].
- RICHBOROUGH.—British coins, uninscribed of silver and copper, and one of Verica [Evans, *Coins*, 112, 181, 469, 476].
- RYARSH.—Uninscribed gold coins [Evans, *Coins*, 62, 64].
- ST. MARY, HUNDRED OF HOO.—Palæolithic implement [Evans, *Stone Imp.* 611].
- SALTWOOD.—Hoard of bronze objects found at Haynes Hill [Evans, *Bronze Imp.* 297, 305, 403, 467; *Arch. Journ.* xxx. 279; *Journ. Anthropol. Inst.* iii. 230].
- SANDWICH.—Uninscribed British gold coin [Evans, *Coins*, 95]. Uninscribed British gold coin, similar to that figured by Evans in Plate A No. 4 [*Min. Soc. Antiq.* viii. 369, 3 Dec. 1761].
- SEAL.—Palæolithic implement [Evans, *Stone Imp.* 608].
- SELLING.—Small palæolithic implement [Evans, *Stone Imp.* 612].
- SEVENOAKS.—British coin of Tasciovanus [Evans, *Coins*, 232].
- SHOREHAM.—Palæolithic implements [Evans, *Stone Imp.* 605, 608]. Neolithic hoe [Evans, *Stone Imp.* 71].
- SHORNE.—Bronze Age (?) interments [*Arch. Cant.* xxiv. 86]. British coins of Tasciovanus [Evans, *Coins*, 229].
- SISSINGHURST.—Gold finger ring [*Arch. Cant.* ix. 12].
- SITTINGBOURNE.—Neolithic arrow-heads, etc. [Evans, *Stone Imp.* 279]. Bronze Age hoard in urns, and Bronze Age grave containing a bronze knife-dagger [Evans, *Bronze Imp.* 113; *Coll. Antiq.* i. 101; *Arch. Journ.* ii. 81; *Arch. Cant.* x. 29. British coin of Eppillus [Evans, *Coins*, 190; *Proc. Soc. Antiq.* (Ser. 2), x. 29-30].
- SOUTHFLEET.—British uninscribed copper coins [Evans, *Coins*, 476, 478].
- SPELDHURST.—Uninscribed British gold coin [Evans, *Coins*, 50].
- STOKE.—Palæolithic implements [Evans, *Stone Imp.* 611].
- STROOD.—British uninscribed gold coin [Evans, *Coins*, 433]. Bronze bracelets and carvings in jet [*Min. Soc. Antiq.* 7 March, 1839].
- SUTTON VALENCE.—British uninscribed gold coin [Evans, *Coins*, 51].
- SWALECLIFFE.—Palæolithic flake found on beach [Evans, *Stone Imp.* 617].
- SWANSCOMBE.—Numerous palæolithic implements [Evans, *Stone Imp.* 607, etc.]. British uninscribed gold coin [Evans, *Coins*, 51].
- TEYNHAM.—Palæolithic implement (large) [Evans, *Stone Imp.* 611]. Neolithic implements.
- THAMES, RIVER.—Bronze leaf-shaped sword-blade found off Greenwich [Evans, *Bronze Imp.* 284; *Arch. Journ.* iii. 230]. Circular bronze shield with 26 concentric rings of studs and a leaf-shaped bronze sword, found off Woolwich [Evans, *Bronze Imp.* 351].
- THANET, ISLE OF.—British uninscribed gold and silver coins [Evans, *Coins*, 52, 111].
- TONBRIDGE.—Neolithic scrapers [Evans, *Stone Imp.* 309].
- TROTTISCLIFFE.—Important megalithic remains, probably of the Neolithic Age, at Coldrum. (*Arch. Cant.* xiii. 16, etc.) Uninscribed gold coin [Evans, *Coins*, 436].
- TUNSTALL.—British coins of Cunobelinus [*Arch. Cant.* ix. 299; Evans, *Coins*, 558, 559].
- WATERINGBURY.—Socketed bronze celt, now in the British Museum [Evans, *Bronze Imp.* 109].
- WESTERHAM.—British coin of Cunobelinus [Evans, *Coins*, 560].
- WESTGATE.—British uninscribed gold and copper coins, one of Cunobelinus [Evans, *Coins*, 86, 95, 325].
- WEST MALLING.—Palæolithic implements found in gravel there [Evans, *Stone Imp.* 610]. British uninscribed gold coins, and one of Tasciovanus [Evans, *Coins*, 435, 535, 536].
- WEST WICKHAM.—Numerous palæolithic implements [*Arch. Cant.* xiv. 85; *Arch. Cant.* xv. 100-102; Evans, *Stone Imp.* 604, etc.]. Numerous neolithic implements, and some hut-circles [*Proc. Soc. Antiq.* (Ser. 2), xi. 161-66, and xii. 258-64; Evans, *Stone Imp.* 248, 295, 310, 334, 604].
- WHITSTABLE.—Palæolithic implement found at Studhill [Evans, *Stone Imp.* 617].
- WILLESBOROUGH.—British uninscribed gold coin [Evans, *Coins*, 434].
- WINGHAM.—British coin of Tasciovanus [Evans, *Coins*, 540].
- WORTH.—British uninscribed gold coin [Evans, *Coins*, 439].
- WYE.—Flanged bronze celt found on Wye Down [Evans, *Bronze Imp.* 52].

A HISTORY OF KENT

APPENDIX

GOLD ORNAMENTS FOUND AT BEXLEY

Since the foregoing pages were written two very important discoveries of gold bracelets have been made at Bexley in the course of digging for sand and gravel in a field on the right-hand side of the top of Dartford Heath Lane.¹ The first find was in July, 1906, when eight objects, like old brass rings, were thrown out of the diggings by the workmen as of little value. Subsequent examination proved them to be bracelets of pure gold, but unfortunately, the men, in their endeavours to ascertain the nature of the metal, broke one bracelet in halves.

A second discovery of bracelets, also composed of solid gold, was made in February, 1907.² In this case the articles were nine in number, and although generally of the same character as those first found, were more slender in form and of course contained less metal.

Both groups of bracelets were found buried in the sand beneath what had been the floors of ancient hut-dwellings. They lay about 3 ft. below the present level of the ground. The fact of these objects being buried in this way is of considerable archaeological importance. It establishes the existence of dwellings of Bronze Age man at Bexley, and it also indicates that in the case of at least some hoards of metallic objects the place of deposit was not only close to, but actually within the limits of, the dwelling. It may well be that such a place of deposit was very rarely chosen, and therefore specially selected for the hiding of these peculiarly attractive and valuable objects. The burial of valuable objects underground within the tent is a practice not unknown in oriental regions.

The bracelets are of solid gold and have no ornamental feature, unless the thickening into seal-like terminations, and the rolled ends of two of the examples in the second hoard are to be so regarded. The weight of the gold is quite remarkable, amounting in one case to upwards of four ounces. They evidently belong to the latter part of the Bronze Age.

The following weights of the bracelets have been obligingly furnished by the authorities at the British Museum, where the ornaments are deposited as treasure trove.

FIRST DISCOVERY (July, 1906).

- (1) 2,080 grains
- (2) 2,046 "
- (3) 2,015 "
- (4) 1,330 "
- (5) 1,070 "
- (6) 1,070 "
- (7) 1,060 "
- (8) 1,047 "

Total, 11,718 grains
(=24 ozs. 298 grains, Troy weight).

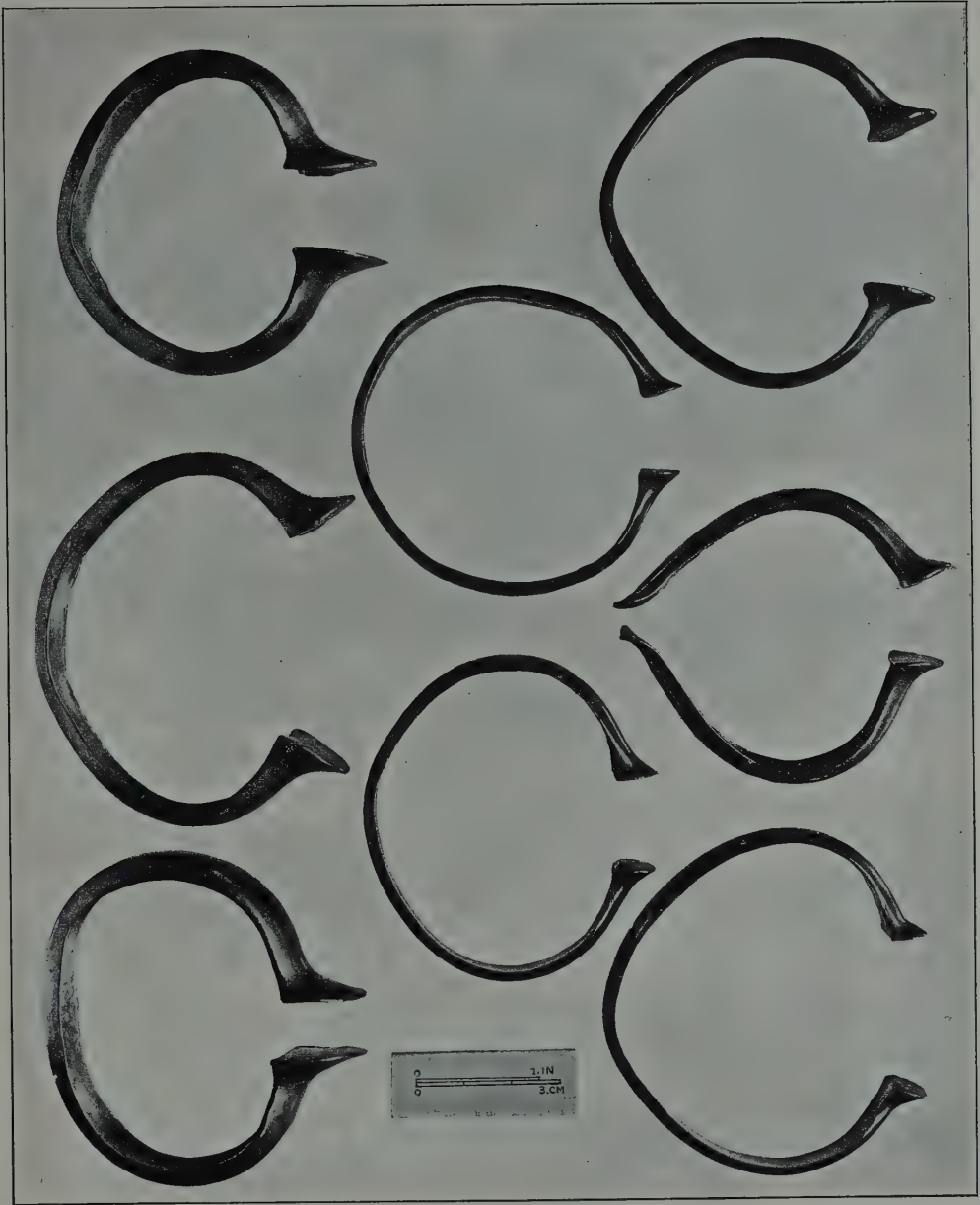
¹ *The Antiquary*, April, 1907, pp. 126-7.

SECOND DISCOVERY (February, 1907).

- (1) 1,420 grains
- (2) 780 "
- (3) 732 "
- (4) 382 "
- (5) 375 "
- (6) 367 "
- (7) 362 "
- (8) 203 "
- (9) 197 "

Total 4,818 grains
(=10 ozs. 18 grains, Troy weight).

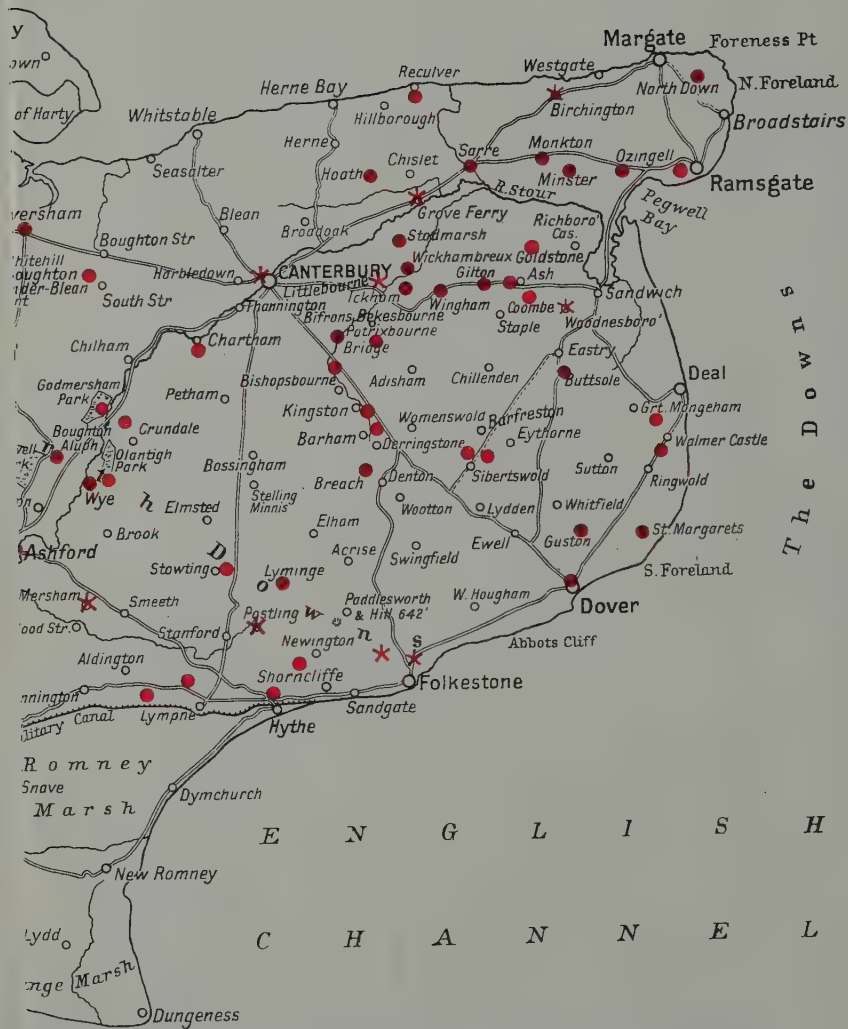
² *Home Counties Magazine*, 1907, p. 151.



GOLD BRACELETS FOUND AT BEXLEY: SECOND HOARD.

($\frac{2}{3}$ Full Size.)

N O R T H S E A



ANGLO-SAXON REMAINS

OF all the British areas occupied by Teutonic immigrants in post-Roman times, Kent should on all grounds have the most explicit record. The richness of the soil in this Garden of England is reflected in the splendid furniture of its Anglo-Saxon graves, and proximity to the Continent might be expected to have placed its inhabitants in the foremost ranks of progress and enlightenment. The reign of Ethelberht (560-616) witnessed the introduction of Christianity by Augustine, and we know that monarch was among the earliest to bear the title of Bretwalda (Wielder of Britain). But these advantages do not lift for us the veil that hides the course of events during the fifth and sixth centuries, when the Romanized Britons were yielding place to newcomers from across the sea. There are indeed traditions, widely known but more than half discredited, which tell of individual leaders and their conquest of the Kentish area, and all that can be gleaned from them has been stated and discussed more than once. There is not likely to be further documentary evidence of early date, and the true story of the English conquest can be recovered, if at all, only from the soil. Such evidence for Kent is fortunately considerable, and a general survey of the finds may prove of more historical value than the tales of Hengist and Horsa.

For Kent alone among our English counties is there a literature dealing with relics of our pagan forefathers; and the task of setting the numerous discoveries before the reader becomes one of severe compression. The peculiar riches of this corner of England became evident in the latter half of the eighteenth century, and found worthy chroniclers in the persons of two divines. The Rev. Jas. Douglas, F.S.A., Chaplain-in-Ordinary to H.R.H. the Prince of Wales, published in 1793 a folio volume¹ with many illustrations and a verbose title-page, detailing the excavations made by himself and others chiefly on Chatham Lines. As was usual at the period, a vast amount of curious lore was incorporated, mostly in the form of footnotes; but the work was carried out in a scientific spirit, and, in the words of the preface, 'the reader may frame his own conclusions without any apprehension of being involved in the confusion of self-opiniated theory.' The author was in sympathetic communication with Rev. Bryan Faussett, of Heppington, near Canter-

¹ *Nenia Britannica; or, a Sepulchral History of Great Britain, etc.*; quoted below as *Nen. Brit.*

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bury, who, between the years 1757 and 1773, had carried out most successful excavations in his own neighbourhood. Exact records were kept, and the antiquities carefully preserved, but it was not till 1856 that his MS. was published,¹ under the editorship of Charles Roach Smith, who died in 1890, and left behind many important papers² dealing with the Anglo-Saxon period. The Faussett collection was acquired by Mr. Joseph Mayer in 1850, and munificently presented to the Liverpool Public Museum, where it is now exhibited. Other contributions to the archaeology of Kent are referred to in the following pages, and special mention must be made of the *Archaeologia Cantiana*, a series of volumes issued by the Kent Archaeological Society since its foundation in 1857; but no attempt has been hitherto made to present as a whole the unexampled series of Anglo-Saxon remains from Kent, with the exception of the Archaeological Survey of the county prepared for the Society of Antiquaries by Mr. Geo. Payne, and published by that body in 1889.

Inscriptions dating from the pagan Anglo-Saxon period are unfortunately rare; but characters belonging to the primitive alphabet (or rather *futhorc*) of Northern Europe occur on several objects found in Kent, though the county has not in this respect proved so prolific as Northumbria. It may be observed in passing that runes are letters, originally adapted for engraving on wood or stone, and are quite distinct from the interlaced or animal-ornament common in northern Europe during the post-Roman period. Several Kentish examples were collected and discussed by Rev. Daniel Haigh³; but, apart from coins on which these characters are often found, only the following can be definitely referred to the county—a jewelled brooch of silver formerly in the Bateman collection; a sword-pommel from Gilton; two sepulchral stones from Sandwich, and a stone slab from Dover, the last-named belonging rather to the series of Early Christian monuments, and therefore not fully described here.



FIG. 1. JEWELLED BROOCH WITH
ENGRAVED RUNES (½).

The brooch here illustrated, one of a pair now in the British Museum, is said to have been found in Kent, but has all the appearance of an exotic, perhaps from S. Germany or Hungary. The garnet cell-work is in excellent condition, and the silver retains some gilding, while the ground-ornament belongs to the fifth century. At the back of the foot are scratched the Runic characters here reproduced, which have been pronounced unintelligible by Mr. W. H. Stevenson.

¹ *Inventorium Sepulchrale*, quoted below as *Inv. Sep.*

² Several were included in his *Collectanea Antiqua* (7 vols. 1848–80); quoted below as *Coll. Ant.*

³ *Arch. Cant.* viii. 164.

ANGLO-SAXON REMAINS

The Gilton sword-pommel¹ is of the cocked-hat pattern, common enough in the south of England but especially in Kent. It was found in the Anglo-Saxon cemetery (p. 354), and is now in the Mayer collection at Liverpool. Though the edges were much rubbed, Haigh deciphered the inscription as **ICU IK SIGI MUARNUM IK WISA DAGMUND**, translating 'I increase victory by great deeds, I, chieftain Dagmund.'

The two sepulchral stones now in the Canterbury Museum are of special interest as having no apparent connection with Christianity, and as being unparalleled in this country, though Horsa's monument mentioned by Bede² as existing in his own day (early eighth century) may have been of a similar description. Both the stones were found about 1830 by Mr. Boys' labourers who were digging in an open field near Sandwich, and one retains in Runic letters the name **RÆHÆBVL** (see fig. 2), the lettering on the other having been effaced almost entirely.³ The inscribed stone is 16 inches high, and 6 inches square at the widest part, while the other is somewhat larger, measuring 17 inches in height, and 5 inches square. It is probable that the thicker portion was the top, the base tapering somewhat and being shaped with less care; but whether they were placed on the summit or in the interior of grave-mounds cannot now be determined. The historian of Sandwich presented them to his fellow-townsmen, Mr. Rolfe, who transferred them to their present resting-place.

The majority of the early cemeteries lie within or close to a triangle of which the sides meet at Canterbury, Dover and Sandwich, and coincide with ancient Roman roads. As in the present state of knowledge it would be idle to pretend to a systematic chronology, it will be convenient to start with the ancient capital, where we seem to be brought face to face with the first Christian king by a chance discovery near St. Martin's Church. Six gold coins, a Roman intaglio set in the same metal, and what was probably the face of a brooch set with garnets or glass slabs in projecting partitions, were found actually on the site of St. Augustine's, and had no doubt been originally deposited in a grave. The grant by Ethelberht of a chapel to his queen Bertha and her priest Luidhard is well known, and it is interesting to find that one rendering⁴ of the lettering on one piece is **LYUDARDVS EPS**.

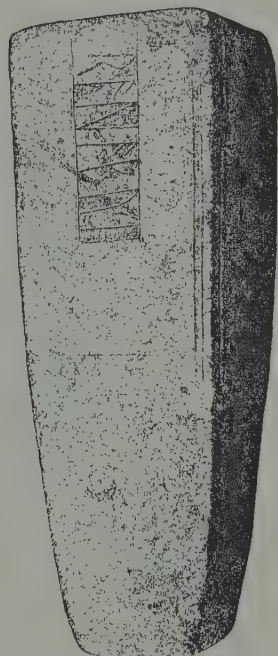


FIG. 2. TOMBSTONE OF RÆHÆBVL, SANDWICH (†).

¹ Figured in *Arch. Cant.* viii. 259 (3 views); Stephens, *Runic Monuments*, i. 370.

² *Eccles. History*, i. 15; Stephens points out that it had disappeared when Alfred made his translation of Bede. ³ Both figured by Stephens, *Runic Monuments*, i. 366-7; *Arch. Cant.* viii. 226.

⁴ Rev. D. H. Haigh, in *Num. Chron.* n. s. ix. (1869), 177, and *Arch. Cant.* viii. 233 (figure); for the find as a whole, see *Num. Chron.* vii. (1845), 187, and *Proc.* p. 28; *Coll. Ant.* i. pl. lv. figs. 6-8, p. 178; *Arch. Journ.* i. 279; *Arch. Cant.* iii. 40. Now in the Mayer collection at Liverpool.

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Roach Smith, however, attributed the coin to Eupardus, a bishop of Autun in the middle of the sixth century, and the rest included a coin of Justin (d. 527), a blundered copy of a Roman type, and a coin of the moneyer Leodulphus.



FIG. 3. GOLD COIN-PENDANT,
ST. MARTIN'S ($\frac{1}{2}$).

As the map clearly shows, the downs to the south-east of Canterbury are thickly strewn with records of the past, and have been explored over a long period. In 1866 about twenty graves were found by workmen on Patricbourne Hill in Bifrons Park, 200 yards east of the road from Bridge and within an area 30 feet square. The relics comprised two swords, two spear-heads, a shield-boss with the stays extending to the circumference,¹ and a number of buckles and knives, taken promiscuously from the graves, which were, with one exception, east-and-west. Interred with a woman were found a necklace of amber and glass beads (the latter of double and treble form, like some from Northants²), a pair of small brooches set with garnets of keystone form (as pl. i. fig. 4), keys, a silver finger-ring, a buckle and stud, all of which are now in the collection of the Kent Archaeological Society.³

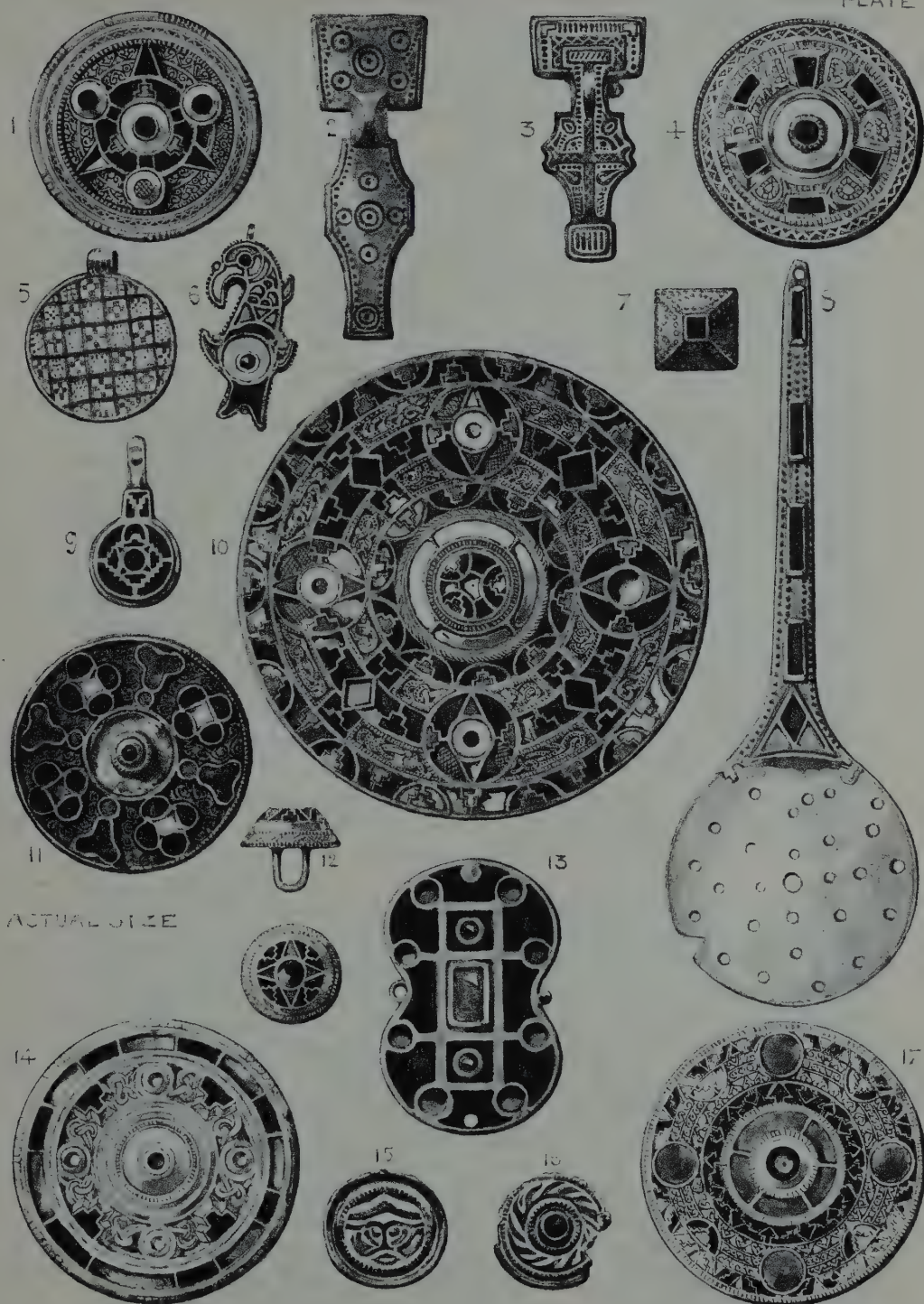
The excavations conducted by Mr. Godfrey Faussett in 1867 at Bifrons are of special importance, as they were carefully recorded,⁴ and the relics now form part of the Kent Archaeological Society's collection at Maidstone. About one hundred graves were opened on the slope of the hill overlooking the Lesser Stour and about $\frac{1}{4}$ mile up stream from Patricbourne Church; and the whole of the district is thickly scattered with interments, perhaps more so than any other area in England. The ground was perfectly smooth, no doubt owing to continued ploughing, and the slope was held to account for the direction of the majority of graves: they had been cut horizontally so as to avoid unnecessary labour, and the head was in these cases at the south or south-east end of the cutting in the chalk. A few, however, lay east and west, generally with the head at the latter point, and the explorer did not fail to notice a comparative scarcity of relics in these graves: both features suggesting a Christian origin. The brooches found were observed to be mostly in pairs, the square-headed variety (pl. i. fig. 2) being invariably worn with the pin-point upwards, the square head being below. Another important point is that no fewer than five graves in this, and at least two in a neighbouring cemetery contained the remains of women with a crystal sphere and spoon (as pl. i. fig. 8) with perforated bowl placed between the thighs. More than once these curious relics were associated with brooches of the Jutish square-headed type (as pl. i. fig. 3) and also of the bird-form, while gold braid was found near the skull as though belonging to the head-dress. Though crystal spheres are not unknown in post-Roman cemeteries on the Continent,

¹ Douglas found the shields were generally $1\frac{1}{2}$ to 2 ft. across (*Nen. Brit.* p. 121).

² *Arch.* lviii. pl. xxiii.; *V.C.H. Northants*, i. 233.

³ *Arch. Cant.* vi. 331 (three figs.).

⁴ *Ibid.* x. 298; xiii. 552.



ACTUAL SIZE

ANGLO-SAXON JEWELS FROM KENT

W. P. R. E. T. O. R. I. U. S. F. O. R. S.

ANGLO-SAXON REMAINS

their frequent occurrence in Kent with brooches of a local character is a fact of considerable importance, and points to some special function assigned to women in this region. A certain number of objects from these graves are certainly of Roman manufacture, while two long brooches (as fig. 14) of bronze are early examples of a type subsequently developed in the Anglian area. Several jewelled ornaments are not of the ordinary kind but resemble continental work, and may be the rude beginnings of the Kentish inlaid work. In one grave of a woman there were found, with a pair of radiated brooches (as fig. 13) and other ornaments, four gold bracteate pendants, three of which bear the usual embossed decoration of dismembered animal-forms, while the fourth has a distorted human figure like that frequently seen on Scandinavian specimens. To the same foreign influence may doubtless be assigned the swastikas engraved on a sword-pommel and belt-plate from this cemetery.

On the downs between Beakesbourne and Adisham, at a point about 4 miles south-east of Canterbury, excavations were conducted by Faussett in 1773.¹ Some of the mounds had been destroyed in planting trees, and nine burials had been at some indefinite period covered with a long bank, regarded by the explorer as part of a fortification. The grave-mounds varied greatly in size, and one reached the abnormal dimensions of 70 feet in diameter and 10 feet in height at the centre, but nothing was found with the skeleton it covered. Another remarkable grave is described and illustrated as cruciform, the four ends corresponding with the cardinal points, and the head lying at the west end, but it was suggested that two graves had been cut at this spot at different times in opposite directions; and this view is supported by a discovery of the sherds of a cinerary urn in the mound. On the other hand, the excavation measured 11 feet each way and at each extremity was an arched recess about 1 foot deep in the chalk, containing wood-ashes and scraps of iron: this may be taken to prove that the cruciform cutting was intentional.

Of the forty-five graves opened, twenty-nine had coffins which in two cases were seen to be of oak, and all but three had been more or less burnt. Besides the exceptionally large mound already referred to, two of fair proportions consisted of flints; and one mound had been erected over two skeletons placed in a sitting posture with their backs against the head of the grave. Bones of small animals were found in two instances, the largest mound containing several heaps, but here as elsewhere the bones of the head were missing, so that it was difficult to recognize the species. Fragments of urns, including red Gaulish and Roman ware, were noticed in several cases, and coins of Diocletian and Maximian, his partner in empire (d. 305), were found. Also suggestive of Roman civilization were two pieces of openwork leather in different graves, probably belonging to sandals.² Only one weapon was found, a lance on the left of the body; but there was a fair sprinkling of shears, keys,

¹ *Inventorium Sepulchrale*, pp. 144-59.

² *Ibid.* p. 152.

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and other female appurtenances. The only piece of jewellery was a blue glass pendant set in silver.

The next site to be noticed lies immediately west of the Roman road between Canterbury and Dover, but still in the same neighbourhood as the preceding. Mr. Thos. Wright described the exploration during 1844 of a number of barrows in Bourne Park (Bishopsbourne).¹ The operations were conducted in the presence of Lord Albert Conyngham, in whose park the barrows were situated; Sir Henry Dryden, Mr. Roach Smith, and the narrator, so that there is every reason to suppose that the greatest care was taken in the excavation. A large barrow proved to have been previously rifled, but unmistakable signs of an Anglo-Saxon interment were noticed, and in the four upper corners of the grave, which measured about 14 feet in length, 6 or 7 feet in breadth, and more than 8 feet in depth, there was a small excavation in the chalk filled with the skulls and bones of mice, mingled with remains of seed. The same deposits appeared in several barrows there and on the Breach Downs.

The second grave-mound was smaller and adjoined the last, scarcely rising above the surface. The body was almost entirely decayed, but seemed to have been placed in a wooden coffin. Near where the right foot must have lain were fragments of small hoops imbedded in wood, evidently the remains of a bucket of the usual type.

The third burial proved similar to the first, the grave being of almost the same dimensions, but the small holes at the corners, which contained bones of mice, being at the sides instead of at the ends.² At the foot in the right-hand corner had stood a hooped bucket measuring 1 foot both in height and in diameter at the base, but tapering upwards. Beside the right leg were found a shield-boss, a horse's bridle-bit, and a buckle, all of iron; while on the right of the head, placed upright against the wall of the grave, was a thin bronze bowl richly gilt, with two drop-handles of iron, of a not unusual type in Kentish burials. The only other articles found in this grave were two discs nearly 1 inch in diameter, convex at the top, one being of bone, the other of the red Gaulish ware improperly called 'Samian.' These were probably counters or draughtsmen used in some game, and may be compared with those found at Sarre (p. 359) and elsewhere. No trace of the body could be discerned, and from the absence of the typical sword and knife, it was surmised that this was merely a cenotaph and that the body had been buried elsewhere.

The barrows opened on this occasion all contained graves cut approximately north and south, the head towards the south, and it was observed that almost all graves at Bourne and on Breach Downs had large flints at the sides and both ends, possibly used to fix a covering over the body before the grave was filled in.³ Two other grave-mounds,

¹ The barrows examined here by Faussett in 1771 (*Inv. Sep.* pp. 95-100) were of much earlier date.

² Plan in *Arch. Journ.* i. 254, fig. 2.

³ *Ibid.* i. 380.

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on the south side of the park, were opened during the Congress of the British Archaeological Association¹ in the same year, and found to contain burials with the head at the west end of the grave, which had been lined with planks. With a woman had been buried a casket, beads, coins called sceattas, a glass cup with applied threads, and a pottery vase 5 in. high at the feet; but the other mound, raised over a warrior, was practically unproductive.

A little southward, on the same side of the Roman road, as many as 308 graves were opened by Bryan Faussett² on Kingston Down between 1767 and 1773. All but forty-five were marked by small mounds of hemispherical form irregularly placed and fairly close to one another on the north-west slope of a hill overlooking the village of Kingston. In 1749 and 1753 a certain number of burials with feet to the north had been found by workmen in digging chalk within a wood and a few relics recovered. Systematic excavation however showed that this orientation was exceptional, as 294 of the total recorded in the *Inventorium* had the head at the west end of the grave. Remains of a wooden coffin were noticed in 183 cases, and of these ninety-seven showed traces of fire, the timber, which was in some cases 3 inches thick, having been burnt to a certain degree (explains the excavator) to make it more durable. In the fourteen irregular burials there was a tendency for the feet to point northwards, while in one case the head was at the east end. In one of these cases the coffin had been burnt, but in eight others no timber could be traced; and in the whole cemetery there were about 100 graves without coffins or any but the slightest furniture. Previous cremated burials had been disturbed in three cases; and the bones, collected in the original urn, were carefully placed outside the coffin at the feet of the interred: in one case the urn was of coarse red earth and seems from the illustration³ to belong to a Kentish type of the Bronze Age, as from Highstead, Chislet (British Museum).

Another unexpected ceramic type occurred in the grave of a male near the head, and the illustration⁴ shows it to be a so-called 'Samian' bowl made in the second century, probably in S. France, and stamped with the name of the potter, Caius (OF. CAII). An Anglo-Saxon vase, usually of small dimensions and of rude black ware, appeared at the feet in seven graves; but these must not be confounded with the earlier cinerary urns, nor with the bottle-shaped vases of buff ware in some of the richer graves elsewhere and at the head of one woman's grave at Kingston. In four graves of women wooden coffers had been placed at the feet, and in two cases at the head; while in the somewhat richly furnished tomb of a warrior, a bronze bowl lay at the feet. Both the form of this vessel and the design of the four circular mounts⁵ (one under the base, the others below the rim to attach chains for suspension) betray Late Celtic influence, and fall into line with enamelled bowls

¹ Canterbury vol. (1844), pp. 96-100: vase figured.

² *Inv. Sep.* p. 66.

⁴ *Ibid.* p. 74.

³ *Inv. Sep.* pp. 35-94.

⁵ *Ibid.* pl. xvi. figs. 5, 5a.

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from this country and Norway.¹ Another burial contained, also at the feet, an iron trivet, resembling one of bronze which supported the bowl just referred to.

Arms were not numerous on this site : only one sword is mentioned and nine shield-bosses,² one of which was with the sword. Of eleven spears noted (not always with the shield) ten lay outside the coffin on the right, some being wrapped in fabric. What is called by the excavator a 'pilum' (probably a lance) occurred in twenty-six cases, on the right or left indifferently. In one case the weapon had been wrapped in some material and reversed, while two others were found to have been 4 feet long, by the position of the head and ferrule. The shield, as at Gilton, was shown by the rivets to have had a thickness of $\frac{1}{2}$ inch.

Glass vessels appeared near the head in five graves, and ivory was used to some extent for ornament. Several earrings were found in women's graves, and armlets in seven instances ; but the principal feature was the comparative abundance of amethyst beads of the usual pattern (as pl. ii. fig. 12), fourteen graves containing one or more specimens. Another peculiarity was the occurrence in seven graves of iron arrow heads,³ which are scarce on Anglo-Saxon sites, but have been found in the Jutish cemetery on Chessell Down in the Isle of Wight.⁴ Six interments included keys or girdle-hangers, and the same number iron shears, evidently used by women, as were the cylindrical thread-boxes of which one was found on this site ; one of the spindle-whorls recovered was associated with two ivory spindles.⁵ Among other relics may be mentioned a touchstone with gold marks in a woman's grave, and six Roman coins, of Claudius (d. 54), Gallienus (d. 268), Probus (d. 282), and Carausius (d. 293), and two of Constantine (d. 337). In view of similar finds elsewhere it may be stated here that one grave contained the skull of a polecat, and bones (but no skulls) of a number of birds, moles, or mice. Three brooches of excellent workmanship must be noticed, having a three-pointed star on filigree ground (as pl. i. fig. 1), keystone (as pl. i. fig. 4), and T-shaped garnets (pl. i. fig. 14) respectively, the first two being from the same grave ; but a detailed description is necessary of the remarkable grave that contained the 'Kingston brooch.'

This was one of ten or eleven double burials noticed in this cemetery, and deserves special mention. Its dimensions were altogether abnormal—6 feet deep, 10 feet long, and 8 feet broad—and the iron-bound coffin appeared to have fitted the grave, but the skull was remarkably small, and was apparently that of a woman whose child had been buried at her feet outside the coffin. Near the right shoulder was the finest Anglo-Saxon brooch⁶ hitherto discovered (pl. i. fig. 10). It is of gold, the face being covered with cell-work of garnets and blue glass pastes intermingled with filigree panels of much debased animal forms,

¹ For list and illustrations see *Archaeologia*, vol. 56, p. 39.

² A conical boss is figured in *Hora Ferales*, plate xxvii. fig. 23.

³ *Inv. Sep.* p. 60, fig. 1.

⁴ *V.C.H. Hants*, i. 388.

⁵ *Inv. Sep.* p. 93.

⁶ *Inv. Sep.* pl. i. fig. 1 (coloured).

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while at the back (see fig. 4) both ends of the pin are surrounded with characteristic animal shapes. It weighs about $6\frac{1}{4}$ ounces, and is the chief treasure of the Mayer collection at Liverpool. With it was a gold pendant of bracteate form with a star pattern, also two small spring brooches of silver recalling the La Tène type. These were lying near the left thigh with an iron girdle-hanger or key. At the feet, with an iron chain of twenty links, and perhaps a casket, was an earthenware vase of unusual type with chevron incisions on the shoulder, and two bronze bowls on a trivet, measuring 13 inches in diameter, and containing the other which had three small loops attached by discs to the rim. A green glass cup of a usual Kentish pattern completed the furniture¹ of the grave, which must have been that of some illustrious lady.

Another woman's grave contained two glass vases,² one on the right of the skull, the other at the right hip; a crystal sphere,³ $1\frac{1}{2}$ inches in diameter without the usual silver bands; a pair of earrings with blue glass beads, an amethyst bead and a silver hairpin.⁴ Twelve amethyst and as many as eighty-six glass beads (as pl. ii. figs. 6, 12, 13) were found in another grave with gold and silver pendants, a pair of equal-armed cross pendants of silver,⁵ a pin of the same metal, and toilet articles. At the feet had been set a coffer containing an ivory comb, bronze and ivory bracelets, a spindle-whorl, and among other items a *concha Veneris* shell; also three knife blades, with a slender sheath of bronze and wood,⁶ a pair of shears, an iron chain, and some indeterminate metal objects.⁷

One barrow that had escaped the notice of Faussett, but belonged to a group close to the Canterbury and Dover road, which yielded the most interesting relics in *Inventorium Sepulchrale*, was opened by Thomas Wright in 1850. It contained a woman's burial, with beads of amethyst

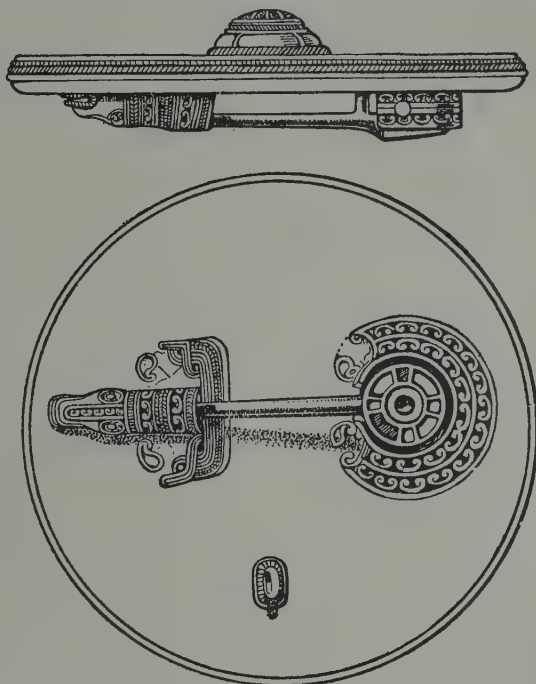


FIG. 4. KINGSTON BROOCH, SIDE VIEW AND BACK (1).

¹ *Nen. Brit.* plates x., xi. pp. 37-47.

² Douglas illustrates several objects from this cemetery: *Nen. Brit.* pl. xxi. figs. 6, 8 (gold pendants); pl. xviii. figs. 2, 7, 8, 10, 11 (toilet articles, etc.); see also Akerman, *Pag. Sax.* pl. xxxi. (three combs).

³ *Inv. Sep.* p. 42.

⁴ *Ibid.* p. 43.

⁵ *Nen. Brit.* pl. xvi. fig. 1.

⁶ *Inv. Sep.* p. 68.

⁷ *Nen. Brit.* pl. xvi. figs. 2, 3.

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and glass at the neck, the largest having been repaired by means of a silver hoop. Shears, which took the place of scissors, lay on the left side, and near the left shoulder was the larger of two knives, with two bronze plates that had evidently ornamented the sheath.¹

The extensive excavations undertaken in 1841 on Breach Downs, about 2 miles south of Kingston, were described for the Society of Antiquaries by Lord Albert Conyngham and John Yonge Akerman.² The site was on the road to Elham and Hythe, and about a mile distant from the high road between Canterbury and Dover. Over one hundred grave-mounds were at that time visible on the downs near the village of Barham, but Sir Thomas Mitchell had explored many of them about 1809. In September 1841 forty-seven were opened in the presence of competent antiquaries. The mounds varied in height from 8 feet at the centre to an elevation scarcely noticeable, but all contained a grave cut in the solid chalk from east to west, and generally from 1 to 2 feet in depth. In the first grave, evidently that of a woman, were beads of crystal (pl. ii. fig. 4), amethyst (as pl. ii. fig. 12), and glass with a gold filigree pendant (pl. ii. fig. 9) set with a cruciform design and central garnet;³ while the second contained a warrior with a sword on his right side, a spear-head, knife, and shield-boss of iron, and a silver belt buckle with oblong plate. Some graves contained nothing but a knife with the skeleton, others not even a knife, while one large mound contained three skeletons, one of which appeared to have been buried in a sitting position.

One grave had a small ribbed vase at the head, and an urn at the feet; another had a rough urn at the feet; and one banded vase 'containing calcined bones' lay at the head of a third skeleton, evidently that of a warrior. In three cases had there been a secondary interment in the top of the mound, and the bones of two mice were found at the feet of a skeleton in a grave widened to permit the right arm being extended to its full length.

The excavations were continued in October, and nineteen grave-mounds were opened. Of these one contained a silver buckle with a triangular plate (as pl. ii. fig. 7) ornamented with gold-foil and bosses, also a circular jewelled brooch, both being typically Kentish, and now in the national collection. The skeleton had a casket between the feet, and a few other personal ornaments. Another mound proved to contain two interments—one near the summit. Part of a horse's jaw was associated with an iron knife in one of this group, and in another burial were included bones of mice and larger animals, which extended for at least 2 square feet on either side of the skeleton from the neck downwards.

In September 1844 Lord Conyngham opened eight more graves on Breach Downs, all lying east and west, except one which had the head at the south end. Few objects of interest were found on this occasion, but at the feet of one skeleton were the remains of a casket with iron

¹ *Proc. Soc. Antiq. Lond.* 1st ser. ii. 58.

² *Arch.* xxx. 47.

³ Figured in colours, with the beads, in *Pagan Saxondom*, pl. v. (British Museum). There also seems to have been an iron-bound coffer at the head of this grave (p. 9).

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fittings.¹ About the same time Rev. J. P. Bartlett made some interesting discoveries in the same locality.² Some *sceattas*³ were found lying on the right of a skeleton with several bronze ornaments, a large ring, decayed wood, and a substance resembling leather, that may once have been a purse. These coins are the earliest native Anglo-Saxon pieces in this country, but are not considered to date before the year 600. They are rarely found in graves; while these, with certain gold coins mentioned elsewhere, point to the seventh century as the date of some Kentish interments, it may well be argued that most of the burials belong to the sixth.

Mr. Bartlett also found a bronze hairpin (see fig. 5) of unusual form, the stem being flat and proportionately broad, and the head cruciform.⁴ Considering the occurrence of *sceattas*⁵ on this site we may be more disposed than usual to regard this as a Christian relic. Sir Thomas Mantell's discoveries were made before the necessity of accurate record was recognized, but three buckles⁶ from this site are preserved in the national collection with beads and a pendant of Maximinus that came from the same grave-mound; also parts of two iron swords of the usual pattern.

Little need be said about the excavations carried out during the Congress of the British Archaeological Association⁷ at Canterbury in 1844, when eight separate grave-mounds, 2 to 3 feet in height, were found to contain spears and shield-bosses or beads, but nothing of special interest came to light.

The next site to be noticed lies about three miles due east on the other side of the Roman road. In the year 1772 Faussett⁸ examined four dozen barrows, 160 paces due east of the burying-place at Sibertswold, but belonging to the parish of Barfreton. The grave-mounds were mostly above the medium size, and arranged with some uniformity in rows running north-east and south-west. There seems to have been no exceptional orientations on this site, and all the twenty-one coffins found had 'passed the fire.' In thirteen coffinless graves were no relics of any importance: indeed, the whole group yielded but little to the excavator. The richest grave was that of a woman, and contained a garnet pendant crossed obliquely by a band of gold, a silver earring with the usual coloured glass bead, and at the feet two green glass phials. A similar garnet pendant was recovered from another woman's grave, in

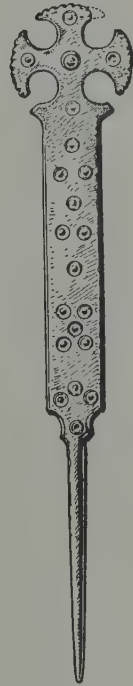


FIG. 5.
BRONZE PIN,
BREACH DOWN
(1).

¹ *Arch. Journ.* i. 379 (earlier excavations), p. 271.

² *Proc. Soc. Antig. Lond.* 1st ser. iii. 137; *Pagan Saxondom*, pl. xxxvi. figs. 2, 3; and pl. xxviii. figs. 6, 7 (child's buckles).

³ *Coll. Ant.* i. p. 7, pl. vi. figs. 11-15.

⁴ *Pagan Saxondom*, pl. xl. fig. 2, and *Journ. Brit. Arch. Assoc.* i. 317. It is now in the British Museum.

⁵ *Coll. Ant.* i. 7, pl. vi. figs. 11-15.

⁶ *Pag. Sax.* pl. xxviii. figs. 2, 3, 5.

⁷ *Canterbury* vol. pp. 91-5, 108.

⁸ *Inv. Sep.* pp. 135-43.

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which were also the remains of a cinerary urn, no doubt of the early Roman period, and disturbed when the grave was dug. Garnets of different shape, but similarly set in gold, were found in another grave, with glass phials at the feet, and amethyst beads of the usual kind, the last being noticed in three instances on this site. The only other glass found was at the feet of a child; but besides that already mentioned there were one or two other cinerary urns of an earlier date, a few earthenware bottles of the ordinary Kentish pattern, and one Roman flask of white ware containing three bronze coins, one being of Constantine the Great (d. 337), and another of Theodosius (d. 395), while the last, according to Roach Smith, belonged to a Gothic king of the time of Justinian (d. 566). The pilum, in two cases compared to an arrow, lay indifferently on the right or left in nine interments. One spear was found, on the right, and in another grave one sword with a shield.

About half a mile from the village of Sibertswold (Shepherd's Well) there existed in 1772 a cluster of grave-mounds¹ lying between the road to Sandwich and that leading from Barham over Snow Down. There were two smaller groups in the immediate vicinity, and as many as 180 graves were opened by Faussett² in that and the following years, all except six being surmounted by mounds of various dimensions. In ninety-nine cases the wooden coffin, which was at times very thick, had been submitted to fire; but in eight cases this ceremony or practice had been omitted, and in thirty-four graves with no traces of a coffin an almost complete absence of relics was noticed. All the bodies were themselves unburnt, and had been buried with the head at the west end except in five instances; and of these four had the feet at the north end and one at the west. Ten mounds, at least, covered each more than a single interment, and in two cases cremated remains of an earlier period had been disturbed in digging the grave. The graves of men contained more than the usual number of weapons. About twenty lances of the smaller kind (called *pila* by the excavator) were found on the right or left side of the body indifferently, in three cases reversed, and in eight accompanied by a shield of which little but the iron boss³ remained, though the wood-work had evidently been $\frac{1}{2}$ inch thick. The *hasta* (or spear) was, however, more frequently on the right side of the body. With eight of them had been associated the shield, and in one case there was a sword, one also being found with a lance, three others being found without either. Two sword-knives were discovered, one being 20 inches long, and one dagger, or short sword, associated with a shield, had a pommel of cocked-hat shape.⁴ Six rude vases of black pottery were found, usually placed at the feet of women, while two graves had vessels of coarse red ware, and one an earthenware bottle of the usual Kentish pattern.

¹ A plan is given by Douglas, *New Brit.* pl. xxiii.

² *Inv. Sep.* pp. 101-34.

³ One, from grave 81, is figured in *Horae Ferales*, pl. xxvii. fig. 22.

⁴ *Inv. Sep.* p. 132.

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Graves of the other sex were as usual more productive, though jewellery was scarce, and the most frequent article was the chatelaine or girdle-hanger, that sometimes took the form of a key. Coffers had been placed in nine graves at the feet, but usually only the iron mounts and hinges remained; on the other hand, a bronze cylindrical thread-box¹ was in good condition, with chains and lid complete, containing small silken strings of two sizes, some raw silk, wool and short hair, as well as some seeds which had apparently been strung on a necklace. Six or seven spindle-whorls (not recognized as such at the time), two combs and six pairs of shears all came from women's graves, while amethyst beads occurred in seven. Several earrings were found, and one silver brooch (pl. i. fig. 1) was jewelled in a three-edged star, with pearl bosses and filigree ground.² One grave contained a gold circular pendant³ with a cruciform corded design and garnet settings; another pendant with coloured glass mosaic, and an oval pair with glass centres of a corded lattice pattern,⁴ as well as amethysts and garnets set in gold for a necklace.⁵ In the same grave were two gold coins⁶ of the Merovingian series, struck at Verdun and Marsal in France, one being mounted as a pendant. In two other graves were found circular pendants of gold with simple cruciform design in raised dots;⁷ and near the neck of another female skeleton were two silver pendants, one of pointed oval shape with a most unusual floral design,⁸ and the other simply embossed and punctured with a cruciform design. Five glass vases or cups were recovered from graves of either sex, and two wooden cups of extraordinary form,⁹ one much patched, were found near the head of what seemed to be a woman's grave.

Having now gone over the country served by the Roman road to Dover, we may turn to a less productive area between Canterbury and Deal. Eastry village is on rising ground $2\frac{1}{2}$ miles from Sandwich and 12 from Canterbury, and on the line of another Roman road between Woodnesborough and Dover. In the triangular area between the Lynch, the *Five Bells Inn* and Buttsole Pond a number of burials were discovered in 1792, which must, from the objects associated with them, be assigned to Anglo-Saxon times.¹⁰ Several graves lying close together in parallel rows from east to west, east of the highway from the cross to Buttsole, contained skeletons, brooches, beads, knives, shield-bosses, and especially several green glass vessels with hollow lobes. The mounds had been previously levelled by the plough, but the cemetery was thought to have extended as far as the Cross. The only two brooches were of Jutish types—small jewelled square-headed, and round-headed with triangular foot. The urns are rudely fashioned, about

¹ *Nen. Brit.* pl. xviii. fig. 1.

² *Nen. Brit.* p. 67 (centre).

³ *Inv. Sep.* pl. xi. figs. 1, 3: *Coll. Ant.* i. pl. vi. figs. 7, 8.

⁴ *Nen. Brit.* pl. xxii. figs. 8-11.

⁵ *Inv. Sep.* p. 115.

⁶ *Inv. Sep.* pl. ii. fig. 6.

⁷ *Ibid.* pl. xxi. figs. 2, 7.

⁸ *Ibid.* pl. xxi. fig. 3.

⁹ *Ibid.* p. 113.

¹⁰ They were considered Roman by the discoverer, Mr. Boteler, whose MS. is quoted by Harris in Hasted's *Hist. of Kent*, 8vo, vol. x. p. 101, and by W. F. Shaw, *Liber Eastriae: Memorials of Eastry*, p. 3. The glass, two urns, girdle-hanger, beads and brooches are illustrated on his plates.

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5 inches high, one with incised chevrons on the body, the other with a small foot and outline recalling a Roman pattern. Other similar remains were brought to light at different times in the village, and skeletons were met with at Southbank about the year 1860. Fragile as they are, certain glass cups found for the most part in Kent were in all probability manufactured abroad and imported into this country. One pattern with constricted body and a small knob in the centre of the base is exceedingly rare in England, but about thirty were found on a farm at Woodnesborough at the end of the eighteenth century, and used at harvest-homes and on other special occasions by the farm-hands. A specimen of rich brown colour, with threads below the rim, is illustrated by Akerman.¹ Some idea of the distribution of such cups may be derived from their occurrence so far apart as at Herpes (Charente) and Envermeu (Normandy) in France, Selzen in Rhenish Hesse, and Oberflacht in Suabia, but the lobed vessels are also widely dispersed, and it is at present impossible to determine their place or places of manufacture.

Before the Society of Antiquaries in 1894 Mr. Geo. Payne drew attention to the peculiar character of some relics of the Saxon period in the Maidstone Museum, which were presented by Mr. W. W. Cobb, and apparently came from Buttsale.² Bronze ornaments for the dress or belt were partly gilt and take the form of fish and birds or are purely geometrical,³ with sunk panels filled with engraved linear patterns or plaits in relief. There were the bronze mounts of one (or two) buckets, and a key with handle swelling in the centre (see fig. 7), while iron arrowheads, which are but seldom met with at this period, recall those from the Jutish cemetery on Chessell Down, Isle of Wight. Other iron objects were three swords much thinner, shorter and narrower than usual, as many shield-bosses, and other details; and it is supposed that all came from the graves of three warriors whose nationality it is difficult to determine.

A considerable number of relics were obtained in 1771 from graves disclosed in a sand-pit at Ash, on the high road from Sandwich to Canterbury. The graves contained coffins, and were distinct from each other, lying 4 feet deep, generally with the head at the west end. The majority were described and illustrated by Boys,⁴ to whose zeal and generosity Douglas refers in complimentary terms.⁵ The list comprises jewelled brooches of the circular and square-headed types, portions of a pair of scales with one leaden and seven bronze weights, two of the latter being coins of Faustina with sundry dots added: a crystal sphere, amethyst beads, girdle-plates, bucket with bronze

¹ *Pagan Saxondom*, pl. xvii. fig. 1; *Nen. Brit.* pl. xvii. fig. 6, p. 71.

² The locality is given as Dover in *Proc. Soc. Antiq. Lond.* xv. 180, but without conviction.

³ A fragment very similar to that on the left of fig. 6 is illustrated in Gen. Pitt-Rivers' *Excavations in Cranborne Chase*, vol. iv. pl. 258, fig. 15, and the resemblance noted p. 89. The locality is there given as Buttsale, near Eastry (see above, p. 351).

⁴ *History of Sandwich*, part ii. (1792), p. 868 (3 plates); most of the objects are in the British and Canterbury Museums; see also *Proc. Soc. Ant.* 1st ser. iv. 334.

⁵ *Nen. Brit.* p. 26, note 1; for illustrations, see pl. vii. figs. 1, 3; pl. xii. and pl. xxiii. figs. 3, 5.



FIG. 6. BRONZE ORNAMENTS, BUTTSOLE ($\frac{1}{2}$).

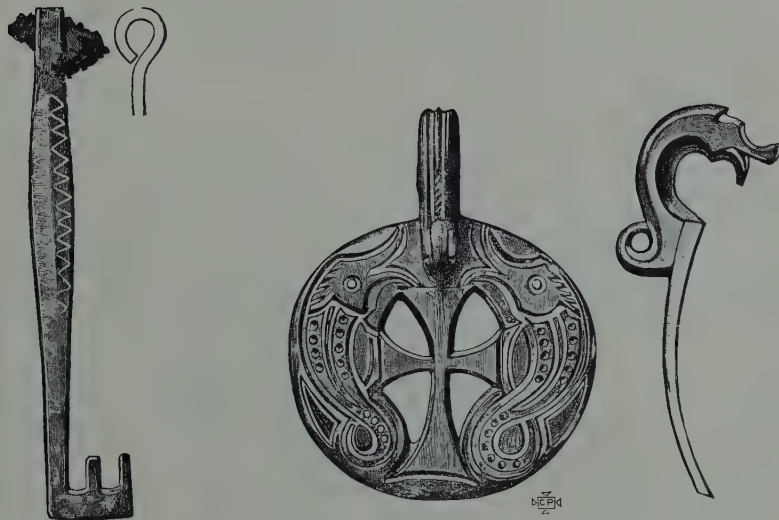


FIG. 7. BRONZE KEY,
BUTTSOLE.

FIG. 8. BRONZE ESCUTCHEON OF BOWL,
FAVERSHAM ($\frac{1}{2}$).

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mounts, an iron axe and shield-boss of the usual form, and a bronze bowl 16 inches in diameter. Roach Smith illustrated a buckle and characteristic bird from this site,¹ and Akerman gives a coloured drawing of a sword pommel with engraved runes.² Further discoveries were made in 1783, including a fine brooch³ with T-shaped garnets, ivory bosses, and gold filigree (as pl. i. fig. 14), while another grave with the head south-west contained a shield-boss and spear, associated with a vase of bottle-form. A coin of Justinian (A.D. 526) found in 1760 throws a certain light on the date of this cemetery.⁴

A valuable series of relics has been derived from a sand-pit at Gilton, in the parish of Ash, on the south side of the Canterbury and Sandwich road. Various excavations were made by Faussett⁵ between the years 1760–1763 in the upper levels of this pit, and the following may serve as an analysis of the record made by himself, in which the particulars are given of 106 graves, one by one. Each grave had contained a single occupant, though in six cases there were signs that in the digging of the grave a previous cremated burial had been disturbed, and it is to the credit of the Anglo-Saxon that the broken pieces of the cinerary urn were collected and suffered to remain in the grave, the burnt bones being readily distinguishable from the later interment. From the discovery of coins of Augustus and Tiberius among the calcined bones in one such shattered urn (grave 50), it may be inferred that the site had been used as a cemetery by the Romano-British population during the first two or three centuries of our era; but the ware is more than once described as coarse, with finger-nail decoration, recalling the cinerary vessels of the late Bronze Age. As a rule the graves were orientated, the head being at the west end, but seven had the feet 'more to the north,' and two were north and south, the feet being at the north end. It may be observed in passing that these nine exceptional graves were poorly furnished, there being no signs of a coffin, and generally nothing but an iron knife or spear-head. Almost exactly half the orientated graves retained traces of wooden coffins, and in seven cases special mention is made of the thick timber employed for the purpose. Some are stated to have passed the fire, but it is possible that the black colour of decayed wood may have deceived the explorer: the application of fire in any case would have been perfunctory, and purely for symbolic purposes.

The sex of the interred could in many cases be decided by the bones or the grave furniture; and in the graves of males there was generally a spear-head by the side of the skull, usually on the right, and occasionally what is described as a 'pilum,' perhaps a missile weapon, on the other side. The latter was in one case found to have measured $4\frac{1}{2}$ feet, in another a foot less, as the head and ferrule

¹ *Coll. Antiq.* ii. pl. xxxvii. figs. 8, 9.

² *Pagan Saxondom*, pl. xxiv. fig. 3; see also below.

³ *Nen. Brit.* pl. ix. fig. 2.

⁴ *Ibid.* pl. xxii. fig. 6, p. 96, found with vase, pl. xxiii. fig. 5.

⁵ Described and illustrated in *Inv. Sep.* pp. 1–34.

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were found in position ; while the spear-shaft, which was found to be of ash, measured with the head 6 and even 7 feet in length. In several cases the spear and 'pilum,' or one of them, had been wrapped in linen fabric and laid on or beside the coffin ; while of the three swords found one lay on the right and one on the left of the body, the position of the other not being stated. This last had an iron pommel filled with lead, and belonged to a grave (66) containing among other things a touch-stone, a pair of scales like those used by goldsmiths and eighteen weights, some of which were Roman imperial coins adapted to the purpose.

In ten cases a vessel had been placed at the foot of the grave, generally outside the coffin : sometimes it was of pottery that had become too soft to remove, though one urn of whitish Roman ware survived ; and sometimes of glass.¹ In one instance a cup of this material was found with a gold coin of Justinian, and in another grave was a vase with hollow lobes or claws, of a type fairly common in Kent. A shallow dish or patera was also found, and in a woman's grave a pair of shears occupied the same position. Other articles found in female interments were a mirror of mixed metal, two brooches probably of Roman workmanship, and two bronze bowls of the usual type but furnished with stands or trivets. Circular brooches with keystone garnets (pl. i. fig. 4) were found in four female graves (to judge by the beads accompanying them), and in another was a jewelled brooch with four discs round a larger centre (pl. i. fig. 17) ; but brooches were not confined to one sex. A square-headed specimen of silver-gilt, of a type peculiar to Kent, was found with a sword and shield ; and two jewelled buckles, with triangular plates and three studs, had also belonged to men. Armlets are rare in the Saxon period, but a specimen of stout bronze with overlapping ends was found at Gilton on the left arm of a male skeleton (grave 89).

About 2 feet below the surface of the long sandy hill² that stretches from Gilton into the parish of Woodnesborough, has been found a large variety of brooches and rings, glass vessels and beads, swords³ and shields, as well as a certain number of coins. Two bronze bowls, found close to the turnpike road⁴ from Canterbury to Sandwich and Deal, are of special interest. One has a diameter of 21 inches, and is 5 inches deep : the rim is flat, with a pearled border, and handles had once been attached by means of half-ovals of metal filled with lead. The vessel had been much cracked, and patched in three places with plates of irregular shape, bearing stamped figures of an unusual character (see fig. 9). On two is a figure with long hair and pointed beard, dancing and playing on a harp or viol of six strings, while from the left hand there hangs the head of an animal. The largest patch is embossed with figures of

¹ One like fig. 21, found with bowl (as fig. 19), is figured in *Pag. Sax.* pl. xvii. fig. 2.

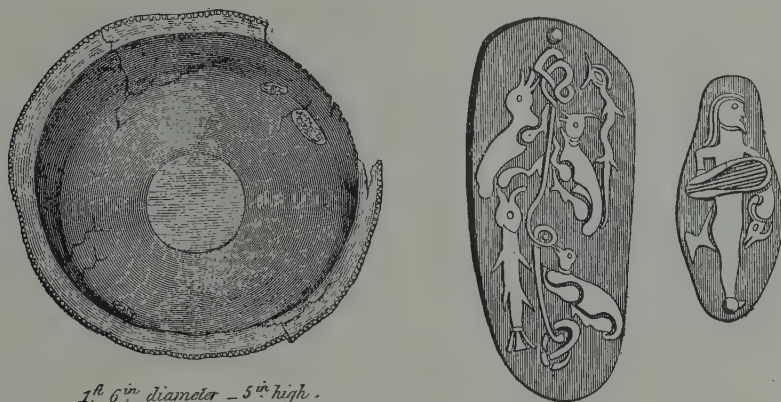
² For remarks on this hill, see Hasted's *Kent* (8vo), x. 122.

³ An elaborate sword-hilt from Gilton is figured by Akerman, *Pagan Saxondom*, pl. xxiv. fig. 2 ; Kemble and Franks, *Horae Ferales*, pl. xxvi. fig. 8.

⁴ Exact details of the site are given by Roach Smith in *Archæologia*, xxx. 133, where the larger bowl and the ornaments are illustrated (pl. xi.).

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confronted quadrupeds and fish separated by a twisted cord terminating in knot-work. This arrangement might be called heraldic, and is strongly suggestive of the well-known oriental motive, consisting of the sacred tree flanked by animals. An enamelled scabbard-mount of silver in the British Museum is a better illustration of its adoption at this period, and the fish frequently occurs in Anglo-Saxon ornaments, perhaps as a Christian symbol. The smaller bowl from this site is of thicker bronze and belongs to a common Kentish type (as fig. 19), having a diameter of 14 inches a pair of angular drop-handles and a circular open-work foot-rim of chevron pattern.¹ Of greater rarity are the brooches; while one is of the smaller circular variety with three garnet settings round the centre, another (like pl. ii. fig. 2) is a late and rare form of the square-headed Jutish type, probably confined to this country. Discoveries at Coombe, also in Ash parish, deserve special mention, though



1st 6ⁱⁿ diameter - 5ⁱⁿ high.

FIG. 9. BRONZE BOWL, WITH PATCHES, GILTON.

the accounts are not so detailed as one could wish. In the British Museum are an olive-green glass cup² and part of a lobed glass said to come from an Anglo-Saxon grave, but it is doubtful whether they were associated with what follows.

Akerman also does justice to a fine sword³ which, with another and a spear-head, some beads, part of a jewelled ornament and a bronze bowl, was found in a grave 6 feet below an artificial bed of clay which had a diameter of 20 yards. The two swords had evidently been wrapped in cloth which had also covered the bowl. The latter had short legs (not the usual openwork foot-rim), and is said to have contained some burnt human bones. Nothing is said as to any skeleton in the grave, and it is possible that in this case, for some special reason, as perhaps at Folkestone, the body was cremated, though the funeral

¹ Akerman (*Pagan Saxondom*, p. 34) states that the green glass cup (fig. 2 of his plate xvii.) was found with a bronze bowl similar to that from Wingham on his plate x.; but the latter has semicircular handles.

² *Pagan Saxondom*, pl. xxvi., cup with ribs and amber-coloured bosses at base.

³ *Ibid.*, pl. xxiv. fig. 1; *Bury and West Suff. Arch. Inst. Proc.* vol. I, p. 27; *Coll. Ant.* ii. 164, pl. xxxviii.; Kemble and Franks, *Horae Ferales*, pl. xxvi. fig. 4.

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furniture was not likewise placed on the pyre. The elaborate sword, which is now in Saffron-Walden museum, belongs to a definite type represented also on the Continent, and has a ring attached to one side of the ogee pommel, perhaps for a sword-knot. Other examples have been found in Kent (as at Gilton), and are not unknown abroad (as Vallstenarum, Isle of Gothland).

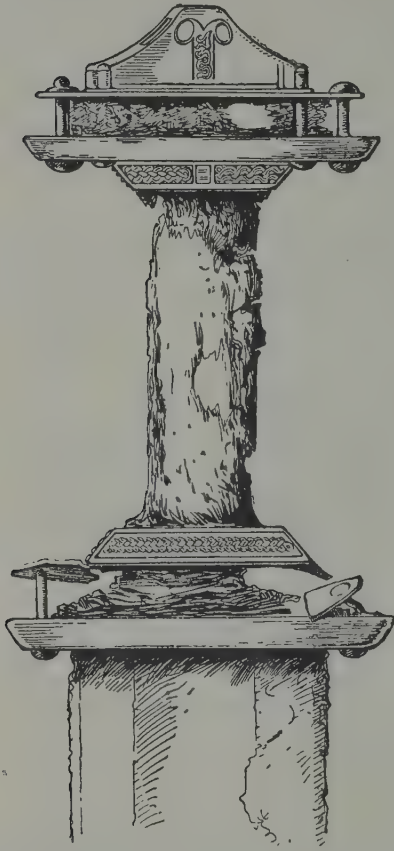


FIG. 10. SWORD-HILT WITH GILT MOUNTS, COOMBE (2).

In the national collection are some interesting relics from Wingham, about midway between Sandwich and Canterbury, excavated by Lord Londesborough (then Lord Albert Conyng-ham) in 1843.¹ Four graves had been found on a hillside on Witherden Farm some time before, containing beads of glass and amethyst, an iron spear-head and other articles; and a similar number were opened by his lordship on the hill-top, one being of special interest. It was shaped like the letter T, one skeleton lying at the feet of another: one, apparently female, had an urn at the feet, and about the body a cowrie-shell, beads, two gold pendants² of bracteate form (pl. ii. fig. 10), a silver bracelet, a jewelled hairpin³ and a fine circular brooch⁴ with star design (as pl. i. fig. 1). The adjoining skeleton had a bronze bowl⁵ of the usual type on the breast.

Eleven years later the same site was explored by J. Y. Akerman,⁶ who found two graves intact among several that had been rifled. One was that of a woman, head west, with beads and what was considered an iron distaff; the other skeleton was a male adult with a few relics of iron.

Other discoveries of some importance have been made in this area. Several fine specimens of Anglo-Saxon craftsmanship are published⁷ from Wickhambreux, and were found in 1886-7 by the late Mr. G. Dowker in a gravel-pit about one-quarter mile east of Supper-ton. Besides swords, shield-bosses and swords there was found a bronze bowl which lay in a large grave with a sword: remains of a leather scabbard were noticed, and next the hilt, which lay towards the west,

¹ *Arch.* xxx. 550.

² *Pag. Sax.* pl. xi. fig. 4.

³ *Ibid.* pl. xl. fig. 3.

⁴ *Ibid.* pl. xi. fig. 1; *Coll. Ant.* i. 104.

⁵ *Pag. Sax.* pl. x.

⁶ *Arch.* xxxvi. 178.

⁷ *Proc. Soc. Antiq.* 1st ser. iv. 199.

⁸ *Arch. Cant.* xvii. 6-9, figs. 1-6 (coloured).

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was a gold stud set with garnets and provided at the back with a loop which passed through a piece of bone or ivory. This stud resembled that figured from the county, and the discovery renders it probable that the peculiar pyramidal jewels (pl. i. fig. 7) sometimes found in this country and abroad were also sword-knots. A fine buckle, with garnet cell-work at the base of its tongue and its triangular plate of gold ornamented with interlacing, was found near the stud already mentioned, and near the sword point was a lobed cup of blue glass.

Finds at Stodmarsh, three miles from Wingham, are of special interest, and are now in the national collection. A grave-mound overlooking the Stour and facing Stodmarsh Court was removed about 1847 and human remains were found, evidently of a man and woman. A bronze bowl and weapons were lost, but the following series was recovered¹:—A square-headed brooch (like pl. ii. fig. 2), a silver brooch with oblong head ornamented with garnet and filigree, a fine buckle with triangular gold plate and three bosses, a 'button' brooch with garnet centre (as pl. i. fig. 16), a spoon with five holes in bowl and garnet on the stem, a filigree stud with green paste, bronze buckles and a pair of shoe-shaped rivets. The spoon may be compared with those from Chatham, Bifrons and Sarre.

In the Pagan period, some fourteen centuries ago, the low-lying ground drained by the Stour and its tributaries can have been little more than a swamp; but one important site stands well within that area, on the road between Canterbury and Ramsgate, this route having evidently been in use at the date in question. The village and neighbourhood of Sarre have proved most prolific in antiquities of the early Anglo-Saxon period, and valuable jewellery has been recovered from time to time. One of the richest finds is now in the national collection and has been well published.² The discovery took place in 1860, 6 feet below the surface of chalk land, where a grave had been cut, the skeleton lying with the head to the north-west. A fine jewelled brooch of circular form, $2\frac{3}{4}$ inches across, lay on the left breast, and closely resembles two found at Abingdon, Berks (now in the British and Ashmolean Museums): it has one large central boss of pearl surrounded by four smaller bosses, all surrounded by garnet cell-work, on a gold filigree ground. A bronze bowl of the usual pattern with openwork foot, but of unusual dimensions, contained bones, but these were doubtless of animals and do not point to cremation. The necklace consisted of coloured glass beads with a central pendant of mosaic glass (pl. i. fig. 5), and four looped gold coins of the emperors Mauricius Tiberius (d. 602) and Heraclius (d. 641), with one of Chlotaire II., King of the Franks (d. 628). These were all barbarous imitations of the *solidus*, but serve to date the burial between 613 and about 650 A.D. Besides a few minor objects there was an iron object in the grave which was described

¹ *Arch.* xxxvi. pl. xvi. pp. 179-81; *Horae Ferales*, pl. xxviii. figs. 7, 8 (coloured).

² *Arch. Cant.* iii. plates ii. iii. iv.; *Gent. Mag.* Nov. 1860, vol. 155, p. 533; *Numismatic Chronicle*, new ser. vol. i. (1861) p. 58, pl. iii.

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as a sword, but was probably something more appropriate in a woman's grave. It has a blade like a short two-edged sword, but terminates at both ends in a tang, the longer no doubt being a handle. Its use as a sceptre is conceivable, but only a few examples have been found in England and abroad,¹ and their use is at present a mystery.

Another splendid example of our early goldsmiths' work was discovered at Sarre in 1843, and though exact details are wanting, it is known to have been associated with a bronze bowl similar to that just mentioned, but 12 inches in diameter, with two drop-handles.² It is a brooch 2 inches in diameter, of which the front is gorgeously decorated with gold filigree and cell-work set with garnets and turquoise (or blue glass); the central boss was damaged, but the rest well preserved, the design consisting of concentric bands of chevrons, step-pattern and rosettes. It is worthy of remark that the head of the pin at the back is set with a garnet, like the Kingston specimen (fig. 4); and the gold front rested on a layer of cement.

Excavations on a more systematic plan were commenced in 1863 and reported on by Mr. John Brent, junr.,³ who pointed out that Sarre formerly had a haven on the Wantsum, and a charter of Edbert, A.D. 726, mentions ships navigating thither, while the Danes sailed past it in 1052. It is remarkable that the site was not explored by Faussett, Douglas, or other antiquaries of their day. A careful inventory of each grave is published, but only a few relics and details of special interest can be dwelt on here. Grave No. 4 was specially rich and the contents illustrated in colour. It was of unusual dimensions, 10 feet long, $4\frac{1}{2}$ feet deep, and 4 feet wide at the foot, expanding towards the shoulders: the occupant had evidently been a lady of distinction; and, as in the famous Taplow barrow, the first indication of the burial was some gold braid that had been woven into a fabric, just above the right hand of the skeleton. Near it was a small finger-ring of silver wire with spiral bezel; and six circular pendants of gold-foil lay between the shoulders. The ornaments embossed on these consist mainly of the distorted and dissected quadrupeds common in Anglo-Saxon work; and it is interesting to note that the design seems to have been fully understood by the goldsmith who applied the loop at the same part of the margin in four of similar pattern. Over 140 beads, mostly amber, lay in the centre of the grave, and amongst them two small bronze brooches with keystone garnet settings, probably joined by a wire. At the head was a glass vessel of a form very rare even in Kent (though thirty were found at Woodnesborough, p. 352), and common in certain parts of the Continent.

¹ Osengal, Kent (*Coll. Ant.* vi. 147), and Chessell Down, I.W. (ib. pl. xxviii.); a fourth is said to have been found near the windmill at Sarre in 1860 (*Arch. Cant.* vii. 318), and one now in the British Museum was found in the Frankish cemetery at Herpes, Dépt. Charente.

² Gloucester vol. of *Brit. Arch. Assoc.* (1848), p. 88, note; this brooch is illustrated in colours as a frontispiece to the volume. It was formerly in the possession of Lord Amherst (*Arch. Cant.* ii. p. xlii.; *Inv. Sep.* p. xxi.).

³ *Arch. Cant.* v. 305; vi. 157; vii. 307; all fully illustrated.

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This remarkable grave further contained two iron latch-keys, a pair of shears, a heavy buckle, and strap-rivets resembling in outline the sole of a shoe : both these last are frequent in Frankish cemeteries as well as in Kentish graves of this period. There were other details, but special mention must be made of a crystal sphere with silver loops and one ring (originally two) for suspension from the girdle : a few inches higher, about the centre of the skeleton, was a garnet-mounted silver spoon with nine small round holes in the bowl arranged as a cross. The significance of this association (which is frequent in Kent) is dwelt upon elsewhere, and it only remains to state that near the crystal lay two square-headed brooches, the smaller one of silver, set with garnets and having a cruciform design on the foot, as at Chessell

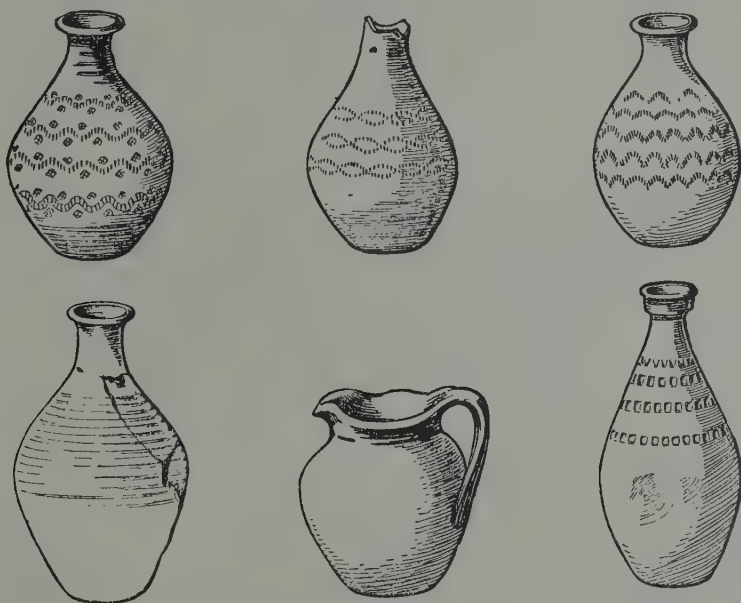


FIG. II. POTTERY BOTTLES AND JUG, SARRE (1).

Down. The larger one, of bronze-gilt, is of a type also represented in the Isle of Wight cemetery.

Of the graves excavated in the autumn of 1863, several call for brief remark. A sword determined the sex of a skeleton accompanied by about sixty draughtsmen, which had been probably placed in a purse. The material is said to have been bone or ivory, but several were no doubt made of horse's teeth like those from the King's Field, Faversham. Some had flat rounded tops marked with incised rings, others were plain and more conical in shape. Angons, as at Strood, were found measuring 42 and 45 inches respectively, and swords had generally been placed on the left side : one grave with a sword had an axe and bucket at the foot, and a shield-boss with stays that gave a diameter of 18 inches for the shield. One grave of a soldier included the beam and pans of a small

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bronze balance and nineteen weights, chiefly in the form of Roman imperial coins. Similar discoveries have been made at Gilton and Ozingell, and are noticed elsewhere. In another grave were small bronze rivets with the worm of the screw still apparent; and elsewhere were ring-brooches, two lobed beakers of brown glass, a jug of black pottery, and a fine jewelled buckle with triangular plate covered by interlaced filigree (as pl. ii. fig. 7); also a bowl on trivet in a soldier's grave, and on a woman's skeleton gold braid of the kind mentioned above but round the skull, and a gold bracteate of the same type as before. More than one characteristic sword-pommel of the cocked-hat shape was found, and chief among the brooches is a long square-headed specimen, gilt and set with garnets, almost identical with one found in the Frankish cemetery of Herpes, in the Charente. Mr. John Brent was no doubt right in supposing that certain types of the brooch, with garnet cell-work covering the entire front, signified a comparatively early date; and comparison with some in the tomb of Childeric (d. 481) suggests the beginning of the sixth century. One grave containing such a brooch had the head at the east end, but nearly all in this cemetery were in the opposite direction, as usual in Kent.

The following year saw the conclusion of the work, 272 graves having been opened. A second grave was found containing draughtsmen or counters, and two dice; fifteen of the total number of about forty had a pair of holes in the flat side that have earned them the curious name of pulley-beads, but were much more probably for fixing the bone to the lathe-centre for turning. Similar specimens have been found in Norfolk (Broome and Castle Acre) and Sussex (Alfriston). Unopened oysters suggest that it was the custom to place food in the grave, and in one grave as many as eighty clench-bolts were found which had perforated wood about three inches thick: similarly thick coffins were noticed at Kingston and elsewhere. Oblong bronze plates¹ from a belt in grave 233 give a very fair representation of the quadruped used at this time as a decorative motive in Anglo-Saxon art, but it needs a practised eye to discern its limbs on some of the bracteates. A jewelled pyramid (as pl. i. fig. 7) occurred with a sword and sheath in one grave as at Broomfield, Essex.²

A summary of the excavations shows that about one grave in ten contained a sword, one quarter of the total containing weapons, and one-third of these graves contained swords. While there are certain signs of early date, two sceattas³ found together suggest that the cemetery continued in use after 600, as these coins are not considered earlier than the seventh century.

With small square-headed brooches, bird and button brooches, and silver earrings from Sarre, comes also a handsome specimen of silver-

¹ Figured in *Arch. Cant.* vii. 313.

² *V.C.H. Essex*, i. 320, where references are given.

³ Figured by Rev. Daniel Haigh, *Arch. Cant.* viii. 171.

ACTUAL SIZE



ANGLO-SAXON ORNAMENTS & GLASS FROM KENT.

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work in the form of a ring-brooch (see fig. 12), which is an elaborate example of a type represented at High Down, Sussex.¹ Near the point of the pin are two birds modelled in the round and working on pivots, while a third is fixed to the base of the pin. The ornamentation consists of a pearled border and two bands of a repeating animal design, much in the style of certain bracteates (pendants of gold-foil) found in Scandinavia² and belonging to the same period. A disc-brooch of bronze engraved in the same manner, with a blue glass cabochon setting in the centre, was found in the King's Field, Faversham, and is now in the national collection.



FIG. 12. ENGRAVED SILVER BROOCH, SARRE (†).
(British Museum.)

Traces of occupation during Roman and Anglo-Saxon times might well be expected at the point where the Wantsum, which made Thanet an island, reached the northern coast of Kent. A green lobed glass³ of the usual type, now in Canterbury Museum, was found at Reculver, and other objects are recorded by Roach Smith,⁴ but without details of their discovery. They comprise fragments of a keystone brooch about $1\frac{3}{4}$ inches in diameter; sceattas, a gold coin and another, mounted as a pendant, of Magnentius (350-3), but the locality of the last is uncertain. At the other mouth of the waterway that once cut off Thanet from the mainland, sporadic discoveries were made near Richborough before 1849. During the draining of Goss-field, at Cup Street near Goldstone, nearly twenty graves with flagstone covers were found containing skeletons, weapons, urns, coins, glass vessels and beads, but here again no systematic exploration was undertaken. One brooch⁵ was of base silver (as pl. ii. fig. 2), and there was a remarkable buckle of *Keilschnitt* work that may with some confidence be assigned to the fifth century, as being directly connected with the late Roman style, an example of which also occurred on the site.

¹ *V.C.H. Sussex*, i. 344.

² Especially one from Lyngby, Randers, Jutland; *Atlas for Nordisk Oldkyndighed*, No. 129; B. Salin, *De Nordiska guldbrakteaterna*, pp. 54, 103.

³ *Pag. Sax.* pl. ii.

⁴ *Richborough, Reculver and Lympne*, pp. 157-8, 213-4; pl. vii. fig. 18, and pl. viii. figs. 2-10; perhaps also fig. 1 (p. 210). Battely, *Antiq. Rutupinae* (1745), pl. vi.; *Bibl. Top. Brit.* i. 75, pl. iii. (coins).

⁵ *Pag. Sax.* xxix. 4; *Richboro'*, etc., pl. v. figs. 1-6, p. 88; *Jl. Brit. Arch. Assoc.* v. 374; *Arch.* xxx. pl. xi. fig. 1, attributed to Gilton in Ash parish, to which Richborough also belongs.

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In the Isle of Thanet much of interest has been found from time to time at Ozingell (Osengal) about 2 miles from Ramsgate. What appears to have been a sword-knife¹ 16½ inches long with wooden handle, iron tang and pommel was found in 1846 with a short knife, spear and shield-boss in the grave of a warrior.² A bunch of Anglo-Saxon keys,³ such as were often attached to a matron's girdle, were found with brooches in a grave disturbed by railway excavations, and a radiated brooch is published from this site⁴; besides these a buckle of base silver was found in a grave hard by at St. Lawrence.⁵ Mr. Rolfe, of Sandwich, watched excavations here in 1846-7, and added several articles to his own collection (afterwards transferred to Mr. Joseph Mayer); but more satisfactory excavations are recorded by Roach Smith.⁶ These were conducted in 1845 on an open tract of down crossed by the Canterbury road as well as by the Ramsgate and Deal railway, and bounded on the west by low ground called Holland Bottom.

From the nature of the case, very little systematic excavation could be undertaken on the site, but a well-illustrated account of all the finds then in Mr. Rolfe's possession was published in 1854. A plan of one out of thirteen graves cut in the chalk and sometimes covered with sandstone slabs shows that a round shield had been placed on the breast of the dead warrior, a spear 6 feet long point upward on his right side, and an earthenware bottle at the left shoulder; while a knife and short sword lay at the waist. Another grave, of unusual width, contained a male and female adult and a child, evidently of one family. Beads of amber surrounded the necks of the woman and child, and the dress of the former had apparently been fastened in front by a long metal pin. Most of the graves, however, contained single skeletons, and, to judge from the weapons, all of the male sex. Spear-heads were numerous, and two iron axe-heads were found, one being of the 'francisca' type; while three double-edged swords of the ordinary dimensions were recovered. The pottery comprised vases and bottles that in part betray Roman influence, being quite distinct from the cinerary urns of Anglian districts, and some dishes of the Gaulish red-ware were included, as elsewhere in Kent. A conical 'tumbler' of pale green glass exactly corresponds to one from Kempston, Beds⁷; and a pair of scales, with a series of weights composed mostly of Roman coins, recalls similar discoveries at Gilton and Sarre, though the marks on the weights hardly bring us nearer to a determination of the system then in use. A purse-guard belongs to a type more frequent in France, and a chatelaine with keys is better preserved than usual. The ornaments included two bronzes⁸ that look like brooches without their heads and pins, of a type intermediate between the Roman

¹ This and two others from the cemetery are illustrated in *Coll. Ant.* ii. pl. lviii. figs. 5, 6, 7.

² *Journ. Brit. Arch. Assoc.* ii. 338.

³ *Pagan Saxondom*, pl. xxviii. fig. 1; brooch found in 1845, *ibid.* pl. xxxiv. fig. 6; and tab of girdle pl. xxxv. fig. 7.

⁴ *Journ. Brit. Arch. Assoc.* iii. 246, 120.

⁵ *Pag. Sax.* pl. xxxix. fig. 5.

⁶ *Coll. Ant.* iii. p. 1, plates 1-6; *Journ. Brit. Arch. Assoc.* i. 242-3; Davis and Thurnam, *Crania Britannica*, vol. ii.

⁷ *V.C.H. Beds.* i. 181, fig. 3.

⁸ *Coll. Ant.* iii. p. 17.

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'cross-bow' and the long brooches of Scandinavia; also a good silver-gilt brooch set with garnets of keystone form; another with cruciform centre and border of garnet cell-work; a more primitive example of the same work (as at Bifrons); a garnet pendant mounted in gold, and a bracteate of that metal in pendant form. A late Roman coin¹ and three silver *sceattas* (probably after 600) were found, the only other coin being a Gaulish copy of the gold *solidus* of Justinian (527-565), which gives an approximate date for the cemetery. Glass beads and various objects of bronze, such as girdle-tabs and rivets, buckles and tweezers, call for no special remark; but a radiated brooch of five points, and two other forms,² point to the fifth century rather than the sixth.

Minor discoveries of Anglo-Saxon antiquities have been made at Richborough and Sandwich (see list), but there were probably few inducements to settle in the low ground that now forms the coast between Thanet and Deal. On the waterworks hill about one mile south-west of Deal and just behind Walmer, several Anglo-Saxon graves have been noticed in section at the top of a chalkpit, and a few characteristic relics recovered. Several trenches, some running parallel in the same locality, are evidently of much earlier date, and may have been dug for defensive purposes, though the ramparts no longer exist. The finds have not been fully recorded, but it may be mentioned that beads and a circular jewelled brooch were found with a woman's skeleton that lay with the head north-east.³

About 1 mile south of this site a discovery was made about 1852 at Ringwould, on the estate of Rev. John Monins, who presented the relics to the nation. They consisted of two iron spear-heads and a ferrule 6 inches long, a knife, a buckle⁴ and buckle-plate set with false gems; and were found with the remains of two skeletons on the road to Deal, 6 miles from Dover.⁵

At St. Margaret's, about 3 miles to the south, Douglas in 1782 opened about fourteen grave-mounds in a group of thirty on the cliff, but found no relics except an iron knife.⁶ They extended over nearly 1½ acres and had been noticed by Stukeley⁷ in 1772: a certain number were opened in 1775, and yielded upwards of twenty glass beads, and a socketed arrow-head, presumably of iron, but suggesting a prototype of the Bronze period. Indeed, one large barrow contained the burnt bones of a young subject and must be referred to the earlier period, this being the primary interment. The skeletons in the other graves were generally east-and-west, and as Douglas suggested, probably belonged to the Christian period, but whether that period began during the Roman occupation or only in the seventh century remains at present uncertain.

A rude saucer-brooch of a type poorly represented in Kent, but

¹ *Numismatic Chronicle*, viii. (1845-6), Proc. p. 2; wt. 3 grains.

² *Coll. Ant.* iii. pl. vi. fig. 1 = *Horae Ferales*, pl. xxviii. fig. 4 (coloured).

³ Information from Messrs. S. Manser and H. Dunn, of Deal.

⁴ *Pag. Sax.* pl. xxix. fig. 1.

⁵ *Nen. Brit.* p. 119; view, pl. xxv. fig. 1.

⁶ *Arch. Journ.* ix. 304 (figs.).

⁷ *Itinerarium Curiosum* (1776), p. 127.

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common in the Upper Thames Valley, passed into the British Museum from the collection of Dr. Lysons, and is said to be from Dover; but there can be no doubt of the Kentish character of other relics from Dover in the same collection, including a superb circular brooch set with garnets and pearls in a cruciform design, amethyst beads and earrings of the usual pattern.

Near the Dover road at Folkestone Hill a radiated brooch¹ was found some years before 1848. It was of bronze gilt, ornamented with a row of garnet slabs set in silver along the stem, and similar stones or glass in the projections from the circular head. The type is also represented at Ozingell and Lyminge in Kent, by solitary specimens in other counties, while a variety occurred on Chatham Lines; but it is more frequent in France and the Rhine district, and belongs to the early stage of Anglo-Saxon settlement. Above Folkestone, on the hill to the west of 'Caesar's Camp,' Roach Smith² dug out a Frankish jug from the site of a barrow; and another opportunity was presented in 1850 by excavations for the foundations of buildings on the hill known as the Boyle.³ No exact record of either find is preserved, and illustrations would have been of special value in both cases. An iron spear-head or sword was found with an urn (broken, perhaps by the workmen) which was filled with calcined bones. This was noted as a most unusual occurrence in Kent, and Thos. Wright asserted that the ware was identical with cinerary urns found in Northants and East Anglia. This and the cinerary bowl at Coombe seem to be the only examples of the kind in the county not obviously Roman.

Turning inland, we enter the district crossed by the Roman road leading due south from Canterbury to Lympne, where interments were found about 1828, at the quarry on the edge of the hill at Bellevue, a mile west of Lympne Camp.⁴ With skeletons had been deposited spear-heads, a sword 15 inches long, a shield-boss, goblet of green glass, pottery bottle of Kentish type, and a buckle with corresponding plate for the belt, both very Frankish in appearance and possibly inlaid with silver in the style sometimes called damascening. Again in 1850 an Anglo-Saxon cemetery was cut through on Marwood Farm at Court-le-Street, but though many skeletons were found, no details of other finds are recorded.⁵

A radiated brooch of bronze with garnets and another of Scandinavian type (see figs. 13, 14) terminating in an animal's head, both from Lyminge, 4 miles north, were presented to the British Museum by Rev. Canon Jenkins in 1890, having been found opposite the rectory some years before, with bones, swords, spear-heads and shield-bosses, during excavations for the Elham valley line. There was also a thin ornament for the neck, which may have been a bracteate: it is said to have had

¹ Wright, *Celt, Roman and Saxon*, p. 482; *Journ. Brit. Arch. Assoc.* iv. 159.

² *Coll. Ant.* ii. 219.

³ *Proc. Soc. Antiq. Lond.* 1st ser. ii. 175.

⁴ *Journ. Brit. Arch. Assoc.* iv. 158 (figs.).

⁵ C. R. Smith, *Richborough, Reculver and Lympne*, p. 263.

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the 'usual Runic characters' upon it,¹ but was no doubt embossed with intertwined animal forms, like that in the chapter house at Canterbury.²

Stowting lies close to the Roman road, about 2 miles west of Lyminge. In 1844, during the formation of a second road from the village to the Common, about a mile from the Roman road between Canterbury and Lymyne, upwards of thirty human skeletons were discovered, with weapons of iron, ornaments, some coins, a pottery vase and a bronze bowl.³ The graves had been cut in the chalk soil, and some of them were capacious enough for six bodies; and while the weapons were confined to the graves of men, those of the other sex were marked by beads and ornaments. The relics were of the usual

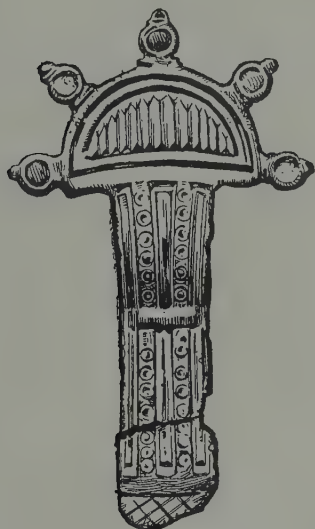


FIG. 13. RADIATED BRONZE BROOCH,
LYMINGE ($\frac{1}{2}$).



FIG. 14. BRONZE BROOCH,
LYMINGE ($\frac{1}{2}$).

kind, the shield-bosses being of ovoid form; and the vessel of light brown ware⁴ was 10 inches high and 25 inches in circumference, with a narrow mouth, the shoulder being ornamented with wavy lines. The basin was 10 inches across and 5 inches deep, without ornament of any kind and of thin metal, closely resembling some from Sandwich. Besides coins of Antoninus Pius, Plautilla, and Valens, much worn by circulation, was a thin bronze coin plated with gold, evidently imitated from a Merovingian or Byzantine specimen.

In 1866 Mr. John Brent unearthed twenty-five burials in a field adjoining the newer road mentioned above.⁵ There was no indication of mounds on the surface, and the graves were irregularly cut, perhaps

¹ *Proc. Soc. Antiq. Lond.* x. 206.

² *Pag. Sax.* pl. xi. fig. 2.

³ *Arch.* xxxi. 398; *Proc. Soc. Antiq. Lond.* 1st ser. i. 28; *Arch. Journ.* i. 69.

⁴ Illustrated by Rev. F. Wrench, who secured most of the objects found in 1844 and bequeathed them to the parish, to be kept as heirlooms in the rectory (*Brief Account of Stowting Parish*, pl. iii. fig. 2).

⁵ *Arch.* xli. 409.

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owing to the stratification of the chalk in which they were sunk. The direction of the interments varied, but the majority were east and west, or north-west to south-east. Those, however, that lay north and south were for the most part the most interesting to the antiquary. An east-and-west grave contained, on the right of the skeleton, a spear, the head of which lay by the right ear, the ferrule by the knee; and touching the blade was a small vase of black pottery surrounded by slabs of chalk and filled to the brim with clear water, which had doubtless drained in from above. An irregular grave, cut north and south, 9 feet long and 4 feet deep, is important as revealing the nationality of the interred. A dished brooch, $\frac{7}{8}$ inches in diameter, has a rude human face engraved in the centre, exactly corresponding to several from Harnham Hill, near Salisbury, and Chessell Down, Isle of Wight, but rare in Kent. On the left lay another brooch of an Isle of Wight type, with a square head and a lozenge design below the bow (otherwise as pl. i. fig. 3); another somewhat larger and with garnet settings was unfortunately broken. A circular Roman brooch with projections from the edge and the central paste-setting missing was described as a girdle-ornament, and among the relics gold wire braid, weighing over $1\frac{1}{2}$ dwts., was found round the skull. One of two Roman coins was of Constantine and pierced for suspension, and 10 inches beyond the skull, carefully protected by slabs of chalk, was a wooden bucket (called a stoup) with ornamental bronze hoops. It was $4\frac{3}{4}$ inches high, and $4\frac{1}{2}$ inches in diameter, the handle being a thin arc of bronze. At one spot there had been two interments, the lower skeleton lying in a contracted position north and south, the upper east and west: the difference in direction may have been due to the introduction of Christianity.

Two articles of purely British origin are illustrated from this site: one an open-work disc with C-shaped scrolls from a grave that was cut north and south and had a recess for the head and shoulders. The other was a curiously-shaped ring¹ of a type common in this country, and was probably affixed to leather near the horse's neck to guide the rein. The grave in which it was found is described as a vault, containing six skeletons all lying north and south. It was circular, with a diameter of nearly 9 feet, and was between 4 and 5 feet deep. The skeletons were of women, and all on the same level, disposed in such a manner that the feet were curved round and lay nearly together, while the shoulders were almost touching each other. It was difficult to assign the various relics, but besides the ring already mentioned, which was described as a brooch, was an openwork escutcheon, probably used to attach the handle to a bucket (like that found between Sandgate and Dover), but called a girdle-ornament. Of the four Roman coins found, two were of Diocletian and Constantine respectively, but of more importance were two brooches: the first of silver covered with garnet cell-work and of quatrefoil form, evidently of Frankish origin; the other of the square-headed Isle of Wight type, but larger than the

¹ A similar piece from the Chessell Down cemetery is in the British Museum.

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specimen mentioned above, being $3\frac{1}{4}$ inches long. Other small brooches were found, some faced with garnets, others of plain bronze, and among various minor articles were two large melon-shaped Roman beads of blue glass.

Mr. Cecil Brent,¹ in 1881, continued his brother's exploration of the site, and found three graves, lying east and west, at the bottom of a trench 10 feet deep cut in soil that had been washed down from above. Of these one was that of a warrior, as shown by a truly conical shield-boss, the only relic; the second was a female interment, with the usual beads of glass, amber and crystal; while the other contained only a few bones. Another group of four graves was discovered, one of which was north and south, and contained the remains of a man who seemed to have been buried in a sitting position; with him had been placed a spear on the right, and on the left a knife 15 inches long and another about half the length evidently in one sheath; also part of an ivory (bone?) comb, an iron oval ring, and a boar tusk, worked. Another of this group contained a small tusk with a small gold earring, buried over a male body by which was a fine iron spear-head. The others contained nothing of interest.

North-west from Stowting, the high ground overlooking the Stour valley had evidently been appreciated by the Romanized population. The excavations conducted by Faussett² in 1757 and 1759 on Tremworth Down in the parish of Crundale, though they resulted in but few additions to his Anglo-Saxon collection, are of interest as pointing the contrast between Romano-British and later interments. It was doubtless this early experience that led him to assign all the cemeteries he explored to the Romanized inhabitants of Kent, though he specially remarks on the differences of orientation in this and other localities. His words are: 'The position of the skeletons here, with their feet to the west or south-west, I am quite at a loss to account for, it being a direct contrary one to what I have met with in all other places where I have since dug—at Ash, Chartham, Kingston, Bishopsbourne, Sibertswold and Barfreton; at all which places they were found, in general, with their feet pointing to the east or near it. Some few, indeed, I have met with at some of those places which pointed with their feet to the north or near it; but I have never found above one (at Kingston, see p. 345), which pointed, as these all did, with their heads to the east and their feet to the west.' There were besides unburnt burials, a number of cinerary urns evidently of Roman manufacture in this cemetery; and though it is not stated in the original account, it may be taken that the latter belong to the first two or three centuries of our era, the practice of burying the body entire dating in this country from about the middle of the third century onwards.

There was, however, at least one Anglo-Saxon burial here, and to judge from the associated relics it was that of a woman. An urn at the feet contained a coin of Faustina, the wife of Marcus Aurelius,

¹ *Journ. Brit. Arch. Assoc.* xxxix. 84.

² *Inv. Sep.* pp. 177-98.

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but this has little bearing on the date of the burial. The decayed wood mentioned was probably what remained of the usual coffer, and the iron chain is of quite common occurrence in Kent. A diminutive chatelaine and small amber beads are also characteristic, but the orientation is the reverse of that usual in Anglo-Saxon graves of the district. It is possible to see in this a blend of British and Teutonic custom, at a time when the Anglo-Saxon was not yet firmly established in the land of the Cantii.

Of special interest, both as a work of art and an indication of date, is the sword-pommel (fig. 15) from Crundale preserved in the British Museum. The blade is incomplete, but of the usual outline, and the interest centres in the hilt, which had two gilt bands, of pointed oval plan, with excellent interlaced work in relief. The pommel is virtually intact, and consists of a silver-gilt terminal of cocked-hat form affixed



FIG. 15. GILT SWORD-POMMEL, CRUNDALE DOWN (†).

(originally) by two rivets to the wooden cross-bar. The ornamentation on both faces is carried out with infinite care and taste, and consists of two interlaced animals with ribbon-like bodies which are held in their elongated jaws. Though not identical with any animal forms characteristic of the seventh century on the Continent, they are undoubtedly related, as indeed is indicated by the form of the handle itself, to specimens

from Ultuna¹ (Uppland, Sweden) and the Isle of Gothland² in the Baltic, while close similarity of the sword to a complete specimen³ from Bildsö Moss (Fyen, Denmark) would justify a restoration on those lines. Dr. Salin has recently published the Crundale specimen, and assigns it to the seventh century, to which the Kingston brooch also belongs; but the bearing of these analogies on the nationality or commercial relations of settlers in Kent must be dealt with subsequently.

In 1858 Roach Smith and Rev. L. B. Larking opened two of a number of grave-mounds on the summit of Wye Hill, to the left of the Dover road: most had been previously disturbed. One contained the bones of a child, the other those of a very tall adult, lying with the head SW., a spear-head by the right shoulder, and a small knife on the breast.* The national collection includes several objects of interest from the downs between Wye and Crundale, but full details of their discovery are not available.⁵ From one grave came part of a keystone brooch, earrings, a pin with garnet head and a silver finger-ring, and, above all, a gold bracteate with applied cruciform design and

¹ Bernhard Salin, *Die Altgermanische Thierornamentik*, figs. 575, 588, 589; Crundale pommel, fig. 709, p. 328.

² Ibid. fig. 580.

³ Figured in *Arch. Cant.* viii. pl. 21, p. 262.

⁴ Davis and Thurnam, *Crania Britannica*, vol. ii., where the skull is noticed.

⁵ List in *Proc. Soc. Antiq.* xiv. 313-5: some found in 1858.

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garnet centre. Special mention must be made of a very large buckle with garnets in a scale-pattern, and along the centre a fish in high relief, the borders containing knot-work filigree. The buckle and corresponding plate are much in the Frankish style, and it is just conceivable that the fish was a Christian symbol in this instance and also on a smaller buckle found at Faversham; it is frequent on continental remains of this period.

In the same valley, about half-way to Canterbury, important discoveries were made in the eighteenth century. Dr. Cromwell Mortimer, Secretary of the Royal Society, had in 1730 superintended the excavation of, and reported upon, a number of barrows in this same area, though he calls it Swerdling (Swadling) Down, in the parish of Chartham. His account is published by Douglas,¹ and in an abridged form by Faussett,² the latter, as a conscientious and eminently sane explorer, having much fault to find with the doctor's preconceptions and conclusions. A brief summary will be enough for our present purpose, and no time need be spent in proving that these graves were not those of Roman soldiers who fell in Caesar's decisive victory over the Britons in Kent. He describes the site of his discoveries with some precision, the mounds being situated about half a mile south of Chartham church along the top of a hill overlooking the Stour, between the roads from Canterbury to Wye and Chilham. The county asylum has since been erected about 1 mile east of this burial-ground, which like many others in the country was popularly associated with the Danes (Danes' Banks). The graves had commonly been cut due east and west, the head being as usual at the west end, and a mass of flints generally covering the body, but no notice was taken of any coffins. The bones are said to have been burnt, but Faussett, who as a boy ten years old had been present at these excavations, was able to correct the doctor's mis-statement. One grave, probably that of a woman, contained a fine gold and silver brooch (as pl. i. fig. 1, but with four points), two glass phials, garnets mounted in gold as pendants, and an ornament of gold wire³ with a cross in the centre and a border of four coils: all these are illustrated in Douglas' *Nenia*, pl. v. To the last-named ornament there was attached by a chain a round-headed pin that may have been a 'union pin,' as found on Breach Down. A crystal sphere and what was no doubt a bronze bowl, $6\frac{1}{2}$ inches in diameter (though described as a helmet or skull-cap), completed the furniture. Another mound covered a burial in which was an urn of red earth, and also a large black cinerary urn, the latter doubtless of Roman origin. Buckles, toilet articles, earrings, and the heads of a javelin and arrow were also found, but there was nothing remarkable in about twenty barrows, of which the largest was 6 feet high and 30 feet in diameter at the base. Mention must however be made of two shield-bosses, one hemispherical and the other conical, found at the head of a skeleton; of a gold

¹ *Nen. Brit.* pp. 99-107; plan of this cemetery on pl. xxiv.

² *Inv. Sep.* pp. 162-8.

³ *Pag. Sax.* pl. xi: fig. 3.

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bracteate¹ found with amethyst beads and a number of trinkets for the chatelaine, one of them of cruciform shape at the lower end,² like specimens from Breach Down in the British Museum.

The fifty-three interments explored by Faussett in 1764 and 1773 on Chartham Down (or more precisely Kenville Down), about 3 miles south-west of Canterbury, were remarkable for the absence of weapons, with the exception of one small lance or arrow. The majority were under mounds, and all the twenty-three coffins found had 'passed the fire.' The comparative poverty of the series is shown by the fact that nineteen graves without coffins were quite devoid of furniture. In one instance a cinerary urn, probably Roman, had been replaced in the grave, and Roman bracelets, a key and stylus were also found in other graves.



FIG. 16. GILT MOUNT OF WOODEN CUP,
FAVERSHAM (†).

A wooden coffer lay at the foot of one grave, while another had in the same position a wooden cup with silver-gilt rim and three triangular mounts, resembling those in the Gibbs collection from Faversham. A few minor ornaments were found in women's graves, but special notice should be taken of a Latin cross found at the neck of a young girl. It

is of silver with a boss of that metal at the centre in a socket of gold. The pair found at Kingston were of the equal-armed or Greek pattern, as are most of the metal crosses of the Anglo-Saxon period. Douglas also gives a drawing of a small round-headed pin set with a garnet³ found during these excavations.

The Anglo-Saxon collection bequeathed to the nation by Mr. William Gibbs in 1870 represents the spoil of the richest cemetery in Kent, the richest of all our counties in this respect. It was amassed during a number of years by purchase from the workmen engaged in excavations for the railway in what was known as the King's Field at the south end of Faversham, and consequently nothing is known as to the distribution of the relics in the graves. Roach Smith published more than one illustrated paper on the finds,⁴ and prepared the catalogue for the Science and Art Department. Perhaps the most striking relic is a large circular brooch⁵ of gold like that from Kingston (pl. i. fig. 10), but smaller with the garnets⁶ and filigree all missing from the cells with which the face is covered. Though glass was frequently used in this cell-work, it was ascertained that some of the jewellery from this site was set with real garnets, the brilliance of which was enhanced

¹ *Pag. Sax.* pl. xi. fig. 5; *Nen. Brit.* pl. xxi. fig. 1.

² *Nen. Brit.* pl. xviii. figs. 3-5.

³ *Ibid.* pl. xviii. fig. 6.

⁴ *Arch. Cant.* i. plates i.-iii. p. 42; iii. pl. v. p. 46; *Coll. Ant.* vi. plates xxii.-xxvii. p. 136; Summary in *Coll. Cant.* 114, and long list of finds in *Proc. Soc. Antiq.* xv. 122; xiv. 313 (Durden Collection).

⁵ *Arch. Cant.* i. pl. ii. fig. 1.

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by a backing of hatched gold-foil. To enumerate any but the principal objects recovered would be wearisome, and a personal inspection of the bequest now at the British Museum is recommended to any desirous of seeing the masterpieces of early Anglo-Saxon metal-work.

Of exceptional rarity is the Christian monogram¹ (if such it be) on the end of a heavily-gilt knife-handle, and there are a few other relics from the site that may date from the seventh century, after the conversion of Kent by Augustine. Perhaps the most striking are the three openwork escutcheons (see fig. 8) from a bronze bowl, for attaching chains to the rim; in the centre is the Latin cross supported by two animals that may be meant for the hippocamp common in late Roman art. Some smaller plates from this cemetery, evidently for the same purpose, are enamelled with the graceful scroll-work that had descended from pre-Roman times and survived for some centuries in Ireland. The Latin cross occurs further on a jewelled brooch, replacing the T-shaped settings sometimes found in Kent; but the cross may here be purely ornamental. The late Roman style is seen on an engraved buckle-plate (see fig. 17) that recalls examples from Sussex² and Bucks³; while the animal-form considered as typical of seventh-century Teutonic art is well seen on a gilt fragment (with animals supporting a fish) and a pair of dainty gold buckles; the jaw is pointed below, and an angular band is placed behind the eye as on the back of the Kingston brooch (fig. 4). Among the rarer specimens may be mentioned three jewelled brooches with T garnets (as pl. i. fig. 14); the ornamented lip of silver-gilt (see fig. 16) probably belonging to a wooden drinking

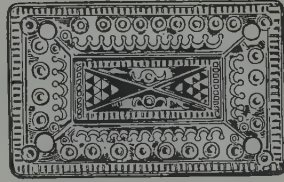


FIG. 17. ENGRAVED BRONZE PLATE, FAVERSHAM ($\frac{1}{2}$).



FIG. 18. STAMPED POTTERY VASE, FAVERSHAM ($\frac{1}{2}$).

Faversham; while three pottery vases of somewhat Merovingian appearance have been found at Faversham (see fig. 18), Kingston (p. 345), and

¹ *Coll. Ant.* vi. pl. xxiv. fig. 7.

² *V.C.H. Bucks*, i. 199.

³ *V.C.H. Essex*, i. plate at p. 322, figs. 1, 13, 14, 18.

² *V.C.H. Sussex*, i. pl. at p. 344, fig. 3.

⁴ *V.C.H. Surrey*, i. pp. 266 (fig. 6), 265 (Farthingdown).

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Broomfield, Essex.¹ The vandyked rim of one among several two-handled bronze bowls (as fig. 19) has at present but a single parallel²; and the bowl here illustrated still contains hazel-nuts; this and several examples elsewhere support the view that the vessels placed in graves contained food



FIG. 19. BRONZE BOWL, KING'S FIELD, FAVERSHAM ($\frac{1}{2}$).

and drink offerings. Most of the pottery found in the King's Field was of Roman manufacture, and consisted of reddish-buff ware with one or two handles. Swords with cocked-hat pommels, spear-heads, and shield-bosses were common, some of the last-named having tin discs attached; while a large number of beads came from the graves of women. A fine set of horse-trappings in gilt-bronze (see fig. 20) exemplifies the



FIG. 20. GILT HORSE-TRAPPING, FAVERSHAM ($\frac{3}{8}$).

art of the period, and a number of draughtsmen made of horse-teeth (as at Taplow) illustrate the well-known gambling propensities of our forefathers. Parallels from adjacent counties have been cited, and it would be surprising if no typical specimens of Frankish work occurred in so large a cemetery. Several pieces of coarse garnet cell-work may have been made across the Channel about the time of Childeric's death (A.D. 481), and there are two small pieces of damascened iron, with silver inlay.

This art was much practised in Gaul, but in England seems to have been confined to the sword or scramasax. Several shoe-shaped rivets for securing the belt to the buckle were also imported like those found in the Isle of Wight.³ There

¹ *V.C.H. Essex*, i. p. 324.

² *V.C.H. Bucks*, i. 202 (Taplow barrow).

³ *V.C.H. Hants*, i. pl. at p. 388, fig. 11.

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are also a number of white bronze buckles of the heavy Gaulish pattern, while the jewelled gold-plated buckles (pl. ii. fig. 7) and hair-pins with heads in the form of birds are of rarer occurrence. The glass in the Gibbs collection is particularly fine, and two typical pieces are illustrated (see fig. 21, and No. 11, plate ii.), the colours being dark blue, pale green, and olive; and two crystal spheres, the larger retaining its metal mount and ring, belong to a type well known in Kent but as yet unexplained.

A richly furnished grave was discovered in April 1894, near Teynham (see list). No particulars of the excavations are forthcoming, but the jewels tell their own tale. A bronze-gilt brooch with a star centre set with garnets and blue glass in gold and ivory (?) was nearly 2 inches in diameter. A gold pendant, looped and in perfect condition, had a diameter of 1 inch, and was also set with garnets and blue pastes, enclosed by bands of a braided pattern. A similar pendant, just over $\frac{1}{2}$ inch in diameter, had a braided cross in the centre with a ball of gold at each point, but the field left plain. A ring of porphyritic marble of the same size and threaded with a silver wire may have been worn as an earring, a similar ring being found in fragments.¹

Within a small area known as Huggen's Fields, north-west of Sittingbourne church, remains of various periods were found between the years 1825 and 1828. They were described by Rev. Wm. Vallance, and published by Mr. Roach Smith, with additional remarks and a map of the excavations.² A hoard of bronze implements in an urn and several cineraries of the Bronze period showed that the place had been occupied centuries before the Anglo-Saxons buried their dead here with the jewels and weapons they had worn in their lifetime.

Though the ground had not been ploughed within the memory of man, there were no signs of grave-mounds, and the discovery was made during excavations of brick-earth. Several articles of value were lost to science, but among those collected were some of peculiar interest, even in the absence of details as to the graves containing them. A circular brooch, presented to the Dover Museum,³ is a splendid example of the Kentish type, the central design being a double star with four studs

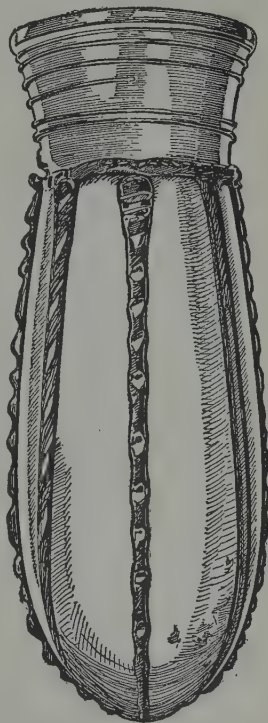


FIG. 21. OLIVE-GREEN GLASS CUP, FAVERSHAM ($\frac{1}{2}$).

¹ *Proc. Soc. Antig.* xv. 184.

² *Coll. Ant.* i. 97, repeated in *Canterbury* vol. of *Brit. Arch. Assoc.* (1844), p. 336; Payne, *Coll. Cant.* 103.

³ Coloured illustration in the *Archaeological Album*, pl. ii. and in Akerman's *Pagan Saxondom*, pl. xxix. fig. 5; fig. 4 of the latter plate represents a bronze buckle from Sittingbourne, now in Dover Museum.

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between the rays, and the face covered with cell-work of garnets and blue glass imitating lapis-lazuli. On the back besides the pin is a loop for suspension, as on the famous Kingston brooch (fig. 4). It lay on the breast of a female skeleton, and underneath it were nine coloured glass beads with inlaid rope pattern, a melon-shaped Roman glass bead and metal fragments. Near the left arm was an annular bronze brooch with engraved design, and on the left hip was a bronze bracelet. Two other graves contained iron shears, and another had, besides beads of glass and amethyst, a pair of earrings, and two pieces of bone or teeth of the dog, tipped with metal and bored for suspension.

In 1880-1 about forty graves were discovered on the Rondeau estate at the west end of Sittingbourne, on the north side of Watling Street.¹ They were situated in an area which contained many Roman burials after cremation; and though at first sight it might be inferred that here the two civilizations intermingled, it must be remembered that cremation ceased about the middle of the third century; and the unburnt burials, with their characteristic weapons, are probably of the sixth century. A sword was found bearing traces of a wooden sheath, and an iron spur from the site is a rarity. An amber-coloured glass goblet was in the same grave as a shield-boss and had therefore been buried with a man; while a red-ware pitcher had an impressed design of Frankish aspect, arranged in wavy lines. Three other swords and shield-bosses, both conical and of the usual pattern, are also in the national collection, to which several objects of interest from graves at Milton-next-Sittingbourne (collected by the late Mr. Humphrey Wood) have been recently added. A gold finger-ring of Roman workmanship with the broad bezel set with a sard intaglio was found in 1889 with a skeleton laid with the head at the west end of the grave, in a brick-field to the north-east of Milton²; in the grave were also a glass vessel, a bronze-gilt buckle, and an iron spear-head, this last pointing to a Teutonic origin, though the ring must date from the second century. Besides these, three large silver brooches of the square-headed type set with square garnets and ornamented with the engraved animal forms common in northern Europe during the sixth century, were found in the neighbourhood and are preserved in a defective condition. Above all, a fine jewel of cell-work, exhibited with these in the British Museum, shows the wealth and craftsmanship of the period. It is of fiddle-back form (pl. i. fig. 13), the base and partitions being of gold; the settings remaining are garnets and sapphire (centre), but several have been lost and probably were of blue glass imitating lapis-lazuli. It is not in the true Kentish style, and is certainly earlier than the majority of jewels found in the county; possibly it was made across the Channel, and the nearest parallel is a buckle-plate found near Houdan, Seine-et-oise.³

¹ *Proc. Soc. Antiq. Lond.* viii. 275, 506; Payne, *Coll. Cant.* 108, where earlier discoveries are also recorded (1869-71).

² Site marked on map in *Coll. Cant.* p. 124; for ring, see p. 119.

³ *Coll. Cant.* p. 120; *Coll. Antiq.* iv. p. 188. pl. xlv.

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In 1852 Anglo-Saxon remains were found in a gravel pit on the edge of the high ground at the top of Otterham Creek, about $\frac{1}{4}$ mile from the famous Roman potteries of Upchurch. Two glass cups of bottle form from this site were exhibited in 1846,¹ and six years later a richly furnished grave was found there, containing a circular brooch of silver-gilt with star centre,² a mammiform cup of light green glass, amethyst beads, a bottle-shaped earthenware vessel, and a Gaulish red-ware dish stamped TITTIVS.F., the last being a survival from the early days of the Roman occupation. A gold coin³ weighing $50\frac{1}{2}$ grains, struck in imitation of an imperial original and pierced for suspension, may have belonged to an interment in this locality.

The next discovery westward was made near the Watling Street at the summit of Chatham Hill, in a field behind the Star Inn, where a gold ring of the fourth or fifth century was found. It was recently presented to the British Museum, and has a niccolo bezel with a Roman intaglio (bird pecking at a snail); pellets flank the oval setting, and the hoop is of a beaded pattern.⁴

Discoveries on the Chatham heights were made as early as 1756 when the Lines were first thrown up, but no proper exploration was made till 1779, when Douglas received permission to dig from the military authorities. His first plate in *Nenia Britannica* gives the plan of a grave below a circular barrow, the head to the south: also the shield-boss, sword, spear-head, buckle and pottery bottle buried with the warrior. The next plate illustrates the contents of a woman's grave, with the head again south. Here were no less than ten earrings of silver wire with glass beads, a number of large beads of crystal, amber and coloured glass, as well as some more important relics that serve to illustrate the close connexion between the inhabitants of Kent and the Isle of Wight at that time. A silver spoon (pl. i. fig. 8) set with garnets was found (as such relics usually are) between the thigh-bones, and was selected by Akerman for illustration.⁵ The bowl had many perforations and was washed with gold, while a hole at the end of the stem had evidently served for attachment to the girdle, the back being worn smooth. Two small square-headed gilt brooches with a cruciform pattern on the foot, and a gilt button-brooch engraved with a human face, also found in this grave, belong to well-marked types, while two small radiated brooches are early specimens of their kind, with three rudimentary projections from the semicircular head. A few Roman coins perforated as pendants were found, including one of Anthemius, Emperor of the West (467-72); they were much worn, and indicate the early part of the sixth century as the date of this grave. The next interment of special interest (*Nen. Brit.* pl. iv.) was that of a woman with the head lying at the north end, about 30 yards from those

¹ *Journ. Brit. Arch. Assoc.* ii. 347 (fig.).

² *Coll. Ant.* ii. 161, pl. xxxvii. fig. i. (coloured); the cup is figured p. 162 *ibid.*

³ Figured in *Coll. Antiq.* vi. 260.

⁴ A rough sketch in *Coll. Cant.* p. 86.

⁵ *Pag. Sax.* pl. xxxiii. fig. 2; now in the Ashmolean Museum, Oxford, with several other objects from this site.

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already mentioned. A green glass cup with pointed base and spreading lip, a finger-ring of silver wire with a spiral coil as bezel, and a debased example of the radiated brooch with diamond-shaped foot accompanied a crystal sphere with silver mounts and two loops. Among the Roman coins was one of Valentinian II. (375-92). The northern position of the head was the rule in this cemetery, and the following four graves (*Nen. Brit.* pls. vii. viii. xv.) contained skeletons so placed. The first contained brooches almost identical with those in a female grave with head south already referred to, of eminently Jutish appearance, while several bronze tubes of oval section belong to a not uncommon type, but are of unknown use. The second included what is described as a bow-brace, but was probably the handle of a shield with extensions to the circumference of the disc; but it must be added that arrow-heads are stated to have been found in these mounds. Another grave was that of a young subject, including a necklace of beads and a fine jewelled brooch of the keystone variety (as pl. i. fig. 4); and the fourth was regarded as a companion grave to one containing nothing but pure Roman ornaments and pointing also north and south. Its contents, however, cannot be mistaken, and the small square-headed brooch with diamond design on the foot, the white-metal studs of shoe pattern, and the woven gold thread are all familiar in female graves, though the radiated brooch in this case was of the continental type, rare in this country. A few Roman objects were found in other graves, and among the coins was one ascribed to Valentinian III. (d. 455). Bottles and vases of undoubted Roman ware occurred in the Chatham grave-mounds, but only one urn,¹ which was found with a skeleton, at all resembled the cinerary urns found in the Anglian parts of England.

Mr. Geo. Payne superintended the excavation of several graves in 1892 at Watts' Avenue,² on the south side of Rochester, near St. Margaret's Church. The bodies had been placed in cists cut in the chalk, all with the head at the west end of the grave; and it was observed that most were females. The customary iron knife was found with most, but little else of note with the exception of a gold kite-shaped pendant set with a carbuncle. Forty years before this discovery, twenty skeletons had been brought to light during excavations for cottages on Star Hill, Eastgate.³ Five spear-heads were recovered, also a bronze bracelet of Roman work, an oblong bronze-gilt buckle-plate set with garnet and engraved with the usual animal design, a keystone brooch of ordinary type, and a number of beads.

An iron spear-head and knives found 7 feet deep with a skeleton between Strood and Temple Farm in 1846 were preserved by the late Mr. Humphrey Wickham,⁴ and the skull examined by Dr. Davis, who pronounced it that of a man about sixty years of age.⁵ Six years later a

¹ *Nen. Brit.* pl. xxiii. fig. 1, p. 93; a bottle is given as fig. 2.

² *Coll. Cant.* p. 121: a few objects in the British Museum.

³ *Journ. Brit. Arch. Assoc.* ix. 408 (4 figs.).

⁴ *Ibid.* ii. 192.

⁵ *Coll. Antiq.* v. 136.

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grave was found in land adjoining a Roman cemetery. It contained a skeleton with the ordinary weapons of iron,¹ shoe-shaped studs, a heavy buckle, and one object of extreme interest. This was a bronze cylinder formed of thin plates riveted together and embossed six times in all with a group of three figures, of which the central one is seated and nimbed, the others standing with hands crossed on the breast. Above the head of one is a cross, of the other a bird carrying a wreath; and below there is a border of foliage and birds. Both the lid and base are wanting, and there is one ring for suspension, so that it may well have been the lip of a drinking horn.² The subject is not quite clear, but its Christian character is evident, and the work should be compared with the stoup from Long Wittenham.³

A further discovery⁴ was made in 1859 when the railway was cut between Strood and Cuxton, one mile west of Temple Farm. A grave contained a skeleton with head at the north-west end, and a spear-head and ferrule, knife, bronze buckle, shield-boss, urn of Kentish type and one of the rare iron weapons usually called angons: this last, with an iron buckle, is in the British Museum.

Five miles due north of Strood, at Cliffe-at-Hoo, railway excavations near the Rectory in 1880 brought to light an Anglo-Saxon cemetery, from which very little was recovered. An iron spear-head, the bronze fittings of a belt, a bronze disc with raised concentric circles (evidently the base of a Roman skillet), and two coins, of Nero and Maximian, passed into the hands of Mr. William Wood, but much more was probably carted away with the large quantity of bones discovered.⁵

Horton Kirby lies about 9 miles west of Strood, and in 1866-7 an Anglo-Saxon cemetery was discovered north of the railway between the Farningham Home for Boys and the river Darent.⁶ Of about twenty-five graves opened most were cut east and west, the feet being at the east end, but at least two had the feet towards the north and one to the south-west. As the chalk is here very hard, the graves were comparatively shallow, and it was observed that they were very short, those of the women being little more than 4 feet long, so that the body was bent at the head and feet. Several of the interments were devoid of relics, and the rest were but poorly furnished, there being no spear-heads, swords or jewelled ornaments found till the latter part of 1867. About eleven more graves, then discovered,⁷ yielded a flint spear-head, an axe-head, several knives and bronze brooches, one large and handsome belt-clasp, bronze mounts of sheaths, many beads, a hemispherical cup of bronze without stem or handle, three urns, and among other items, a large shield-boss. The form of the urns is not specified, but as the largest lay at the right shoulder of a skeleton and a small

¹ Several figured *Coll. Ant.* ii. 158, pl. xxxvi.; coffer, fig. 1.

² Dr. Haigh considered it the mouth of a quiver (*Arch. Cant.* viii. 220, note).

³ *V.C.H. Berks.* i. 230.

⁴ *Coll. Ant.* v. 129, pl. xi.; *Arch. Cant.* ii. xli.

⁵ *Arch. Cant.* xiii. 502.

⁶ *Arch. Journ.* xxiv. 281.

⁷ *Ibid.* xxv. 94.

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black one at the feet, it is clear they were merely accessory, and not cinerary, vessels. It may be added that a pair of bronze brooches found at Horton Kirby, and now in the Kent Archaeological Society's collection at Maidstone, belong to the saucer type, which seems practically confined to the West Saxon area. Another pair from the King's Field, Faversham, are in the same collection ;¹ others from this site and one said to be from Dover are in the British Museum.

Further up the valley of the Darent, one of the most interesting relics of the early Anglo-Saxon period was discovered in 1860 by labourers digging for brick-earth near the railway north of Lullingstone, and is now in the possession of Sir Wm. Hart Dyke. It consists of a bronze bowl² 10 inches in diameter, with various bronze ornaments attached to the outside³ and was associated with human skulls and bones, as well as fragments of iron and pottery. The profile closely resembles that of the bowl found in Lochar Moss, Dumfriesshire, containing a beaded collar of Late Celtic work, and similar bowls are known from Ireland as well as from South Britain. The four discs which serve to attach the chain-hooks to the outside of the bowl are ornamented with the Celtic trumpet pattern ; and several discoveries of the kind seem to show that native British art was not entirely suppressed, even in Kent, by four centuries of Roman domination. The exact date of the Lullingstone and similar bowls cannot at present be determined, but the cruciform character⁴ of the openwork disc outside the bottom of the bowl may well be due to Christian influence ; and the stag-like animals resemble in style the symbol of St. Luke in the Book of Durrow,⁵ an Irish illuminated MS. attributed to the seventh century, but probably later.

An interesting group of grave-mounds (barrows or *tumuli*) can still be seen in Greenwich Park⁶ south-west of the Observatory, and the depressions at their summit show that the excavator has been at work. The footpath that now runs through them is at a mean distance of 100 yards north of the reservoir, for which twelve other grave-mounds were cleared away, but on representations from the Archaeological Institute⁷ and at a sacrifice of £850, the present site (SE. of the existing group) was substituted in 1844. Fifty had been thoroughly explored by Rev. James Douglas⁷ in 1784, but comparatively few relics were recovered. The graves were shallow, being in the gravel about 18 inches below the original surface, and the decayed remains of coffins were noticed. Iron knives, a shield-boss, and spear-heads measuring 10 and 15 inches, were taken from some of the graves, others evidently being those of women, and containing well-preserved locks of hair as well as linen and woollen fabric.

¹ *Proc. Soc. Antiq. Lond.* xv. 123.

² *Arch. Cant.* iii. pl. i. p. 44 ; *Proc. Soc. Antiq.* 2nd ser. i. 187 ; *Archæologia*, lvi. 41.

³ Compare the Kingston bowls (*Inv. Sep.* pl. xvi. figs. 6, 8 : grave 205), but the cross is not altogether convincing.

⁴ Westwood, *Facsimiles*, etc., pl. v. p. 22.

⁵ Plan in *Arch. Cant.* xiii. 15.

⁶ *Journal*, i. 166, 168, 249.

⁷ *Nen. Brit.* 89, 56 (note).



FIG. 22. BRONZE BOWL, LULLINGSTONE ($\frac{1}{3}$).



FIG. 23. BRONZE-GILT HOOP OF BROOCH, CANTERBURY ($\frac{1}{4}$).

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A similar discovery at Dover may be conveniently noticed here. Several enamelled discs were found in the Old Park in 1861, comprising four with a curvilinear swastika in the centre (one retaining its hook, as fig. 24), a narrow curved band¹ enamelled in the same style as the border of the discs, a hooked disc of similar dimensions but with star centre and a border of running scrolls, and two smaller discs, one having a kind of handle. Unfortunately there is no further record of the discovery, but there can be little doubt that all belonged to a bronze bowl (possibly two), and metal strips have been found in such association on more than one occasion. Though their Celtic origin is evident, the precise use and date of these enamelled bowls have still to be determined. These discs were presented to the Dover Museum by Mr. W. Clayton.

Mention may here also be made of some enamelled discs, evidently from a bowl of similar kind, found in 1862 near the site of the Old Tilt Yard at Greenwich on the north side of the Hospital. The design² is of Celtic origin, and is thrown up by red champlevé enamel, while the diameter of $\frac{1}{8}$ inch is about the average, somewhat larger than those from Lullingstone. The work was at the time referred by John Brent to the seventh century, after the conversion of Kent; and the three discs, with one of the frames provided with a hook for the suspending chain (see fig. 24), were transferred by him to the Canterbury Museum.

Among so much that is pre-eminently Kentish, there are a few ornaments that show intercourse with the Continent, whether by way of commerce or colonisation. A common Rhenish and Burgundian type of brooch, with peculiar animal-head terminal, has two representatives in Kent, one from Gilton³ being without the radiations from the head that are seen in the illustration (pl. ii. fig. 5); the original is in Canterbury Museum, but the locality unknown. On the same plate (fig. 3) is a bronze-gilt brooch, quite exceptional in England, and most probably imported from Denmark in the fifth century.

Scandinavian influence is evident in the few 'long' brooches found in the county (as Lyminge), terminating in a head seen from above and somewhat resembling that of a horse, the eyes and nostrils being exaggerated. A large specimen is published from Gilton,⁴ but the small size is more usual, and has been found at Faversham, Lyminge (fig. 14), and Bifrons.⁵ Radiated brooches, which seem to belong to the middle



FIG. 24. ENAMELLED ESCUTCHEON OF BOWL, GREENWICH ($\frac{1}{8}$).

¹ A similar fragment found near Dover was given to the British Museum by Samuel Lysons.

² *Proc. Soc. Antiq. Lond.* 2nd ser. ii. 202.

⁴ *Arch.* xxx. pl. xi. fig. 6.

³ *Arch.* xxx. pl. xi. fig. 3.

⁵ *Arch. Cant.* x. pp. 305, 308 (two).

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Rhine, are more frequently met with in Kent, but are rare in other English counties. The most primitive form occurred on Chatham Lines,¹ where two specimens with a diamond-shaped foot were also found²; but others from Ozingell, Folkestone, Lyminge and Bifrons (two), together with one in Canterbury Museum, are of the usual form, with blunt terminals (fig. 13).

A massive brooch from Bifrons with square head and circular bow³ is hard to classify, but three silver specimens⁴ of similar style but on a smaller scale (as pl. ii. fig. 2) appear to be a late form of the Jutish square-headed brooch (as pl. i. figs. 2, 3).

The above represent only a small proportion of the rich harvest from Kent, and there can be no hesitation in attributing such types as the circular brooch with keystone and T garnets, the cell-work circular brooches and the small square-headed specimens with a cruciform or lozenge design on the foot, to Kentish craftsmen. One or two pieces of cell-work somewhat in the Kentish style are known on the Continent, and the Jutish square-headed brooch seems to have occurred in the Herpes cemetery, Dépt. Charente, but was no doubt made in England. It is clear that in the pagan period, at least, our Anglo-Saxon predecessors enjoyed a splendid isolation, though such objects as bronze bowls with openwork feet, spoons with perforated bowls and crystal spheres are common to both sides of the Channel. On the other hand, it would be hard to find an exact parallel anywhere to a jewelled brooch (pl. i. fig. 11), now in Canterbury Museum and probably found in the county. The cell-work seems to represent bees,⁵ as in the tomb of Childeric, but the present specimen is later than 481, and is more likely of the sixth century.

It might reasonably be expected that the exceptional number and richness of Kentish Anglo-Saxon burials would throw a new light on the racial affinities of its earliest Teutonic settlers; but in truth the finds do little more than justify the Venerable Bede. Enough has been said to show that the grave-furniture of Kent and the Isle of Wight is different from that discovered elsewhere, and there can be no objection to explaining this phenomenon by Bede's assertion that both areas were inhabited by Jutes. Who the Jutes precisely were and whence they came are questions that will perhaps never be satisfactorily answered,⁶ but it is interesting to find some traces of the race in the physical characteristics of the present population. A peculiar cast of features, illustrated more than once in works on the subject,⁷ has been regarded as Jutish, and noticed in the interior of Kent, especially near Tonbridge and Canterbury, in Wight and the Meon district of Hants.⁸ In the

¹ *Nen. Brit.* pl. vi. fig. 4.

² *Ibid.* pl. iv. fig. 7; pl. xv. fig. 5 (Rhenish terminal).

³ *Arch. Cant.* x. 313.

⁴ Gilton or Richborough (see above), and Stodmarsh (British Museum).

⁵ *Mémoires des Antiquaires de France*, 1894, p. 137; Boulanger, *Mobilier funéraire*, pl. xxv. fig. 2.

⁶ W. H. Stevenson, *Engl. Hist. Review*, 1899, p. 42.

⁷ Beddoe, *Races of Britain*, pp. 40, 256; Ripley, *Races of Europe*, p. 332 and p. 316, Nos. 121, 122.

⁸ Mackintosh, *Trans. Ethnol. Soc.*, new ser. i. 213; Harrison, *Journ. Anthropol. Inst.* xiii. 86.

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north and east of the county Teutonic types are said to preponderate, as in the heart of Thanet and near Sandwich ; and Frisian characteristics have been noticed in the north and sporadically in the interior, while the south shows more affinity to the opposite Gaulish coast, and Romney Marsh and the Weald preserve a purer British strain. All this sounds probable enough, but further precision seems hopeless.

The bulk of the antiquities hitherto noticed from Kent belong to the sixth century of our era, but a few notable pieces serve as specimens of the artistic work executed by native craftsmen in the century that began with the mission of St. Augustine. There are still a few relics of a later age, when Christianity was fully established in Kent, to show the gradual transformation of style under foreign influences. The remaining series may be introduced by a find that can be dated precisely by associated coins.

In 1838 a remarkable silver cross¹ was dug up at Gravesend between Perry Street and the cemetery with a quantity of coins that fix its date. It is now in the national collection, and is of Greek form with equal arms. At the top is a loop for suspension, and in the centre a glass dome, evidently part of a bead, with blue and white markings in a gold mount of rope pattern. As on the Canterbury brooch, there are interlacings at the extremities, and in this instance they seem to be mere sketches, roughly executed with a sharp-pointed instrument, perhaps with a view to filigree ornament. As many as 552 coins were found in association, and the following are the monarchs represented :



FIG. 25. PENDENT CROSS OF SILVER,
GRAVESEND (†).

Louis, of France (1)	814-840	Edmund, E. Anglia (50)	855-870
Ceolnoth, Abp. of Canterbury (3)	830-870	Ethelred (57)	867-872
Ethelwulf (3)	837-857	Alfred (1)	872-901
Burgred, of Mercia (429)	842-874	Ceolwulf II. of Mercia (1)	874
Ethelweard, E. Anglia (5)	855	Athelstan I., E. Anglia (2)	828-837

In spite of a wrong attribution to Athelstan II. (Guthrum), Mr. Hawkins concluded, on various grounds, that the deposit was made about 874-5, a date that closely corresponds to that of the Trewhiddle hoard.² Burial of treasure just at that time may well be explained by the activity of the Danes on our coasts.

Of the same general form is the bronze cross (fig. 26) found in St. George's Street, Canterbury, about 1860.³ It has been used as a

¹ *Numismatic Chronicle*, iii. (1840), p. 14, fig. p. 34 ; see also new ser. viii. 150 (other hoards compared).

² *V.C.H. Cornwall*, i. 376.

³ So *Proc. Soc. Antiq.* 2nd ser. i. (1861), 287 ; see also John Brent, *Canterbury in the Olden Time*, 2nd ed. pl. xvii. fig. 1, p. 47.

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brooch, though the pin is now missing, and the arms are ornamented with leaves attached to a wavy stem, while the centre is raised and slightly tapers. To the centre of each arm is attached a triangular silver plate, engraved with a looped triangle filled with niello, a favourite design in manuscripts¹ and metal-work in the tenth and late ninth centuries.



FIG. 26. BRONZE CRUCIFORM BROOCH, CANTERBURY (†).

Another relic of the Danish period is a bronze-gilt penannular brooch² (fig. 23), without its pin, found at the North Gate, Canterbury, at the end of 1901. The terminals were moulded in relief with a geometrical design and grotesque animal heads that are strongly suggestive of Scandinavia, and it may be that the brooch was lost by a Northman in the attack on Canterbury in 851, the year when

the heathen army wintered for the first time in England.

At Canterbury also was found the largest 'coin-brooch' known, (fig. 27) enclosing a medal in the style of Eadgar's coinage and bearing the legend **NOMINE DOMINI** and **+pVDEMAN FECID**.³ The brooch is of silver, over 3 inches across, and has twelve concentric rings forming a pearly border, while the back is braced with V-shaped strips of silver. The maker's name, Woodman, must have been common enough, and a moneyer of that name was minting at Shrewsbury under Edward the Confessor: the brooch was probably made about 970-80.

A remarkable knife of the later Anglo-Saxon period from Sittingbourne was described by Sir John Evans in 1872.⁴ It is $12\frac{3}{4}$ inches long and has a maximum breadth of $1\frac{3}{8}$ inches, the tang measuring $3\frac{1}{2}$ inches. From the single cutting edge the blade thickens, and the back is inlaid with a strip composed of alternate pieces of silver and brass. The principal face is inlaid with the same metals in panels with a border below, and the owner's name is inserted in two parts: **+ S GEBEREHT M EÂH**. On the other face the maker's name is given in a continuous strip, **+ BIORHTELM ME PORTE**, with inlaid borders above and below. While the latter inscription was no doubt executed at the time of manufacture, the former seems to have been inserted subsequently, when the knife passed into the possession of one Sigebereht, if that is indeed the true reading of the name. There is, however, a wide space between **S** and **G**, and no signs of an intermediate letter having dropped out. The **S** preceded by a cross recalls the legends of seals in the middle ages, the letter standing for *Sigillum*; but in this connexion it could only have been inserted by mistake, and the name may possibly be **GEBEREHT**, followed by the Anglo-Saxon for 'owns me.' Here again the reading is uncertain, the more natural

¹ As *Brit. Mus. Egerton MS.* 768, opening of St. John's Gospel.

² *Proc. Soc. Antiq.* xix. 298.

³ *Ibid.* xix. 210.

⁴ *Arch.* xlv. 331; Payne, *Coll. Cant.* 111.

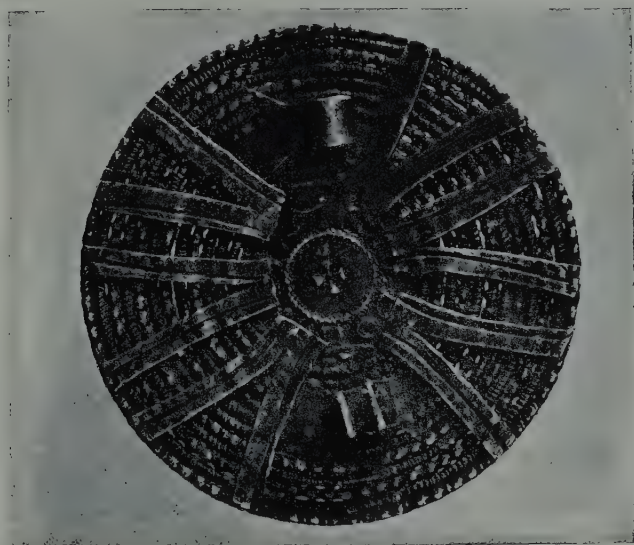


FIG. 27. SILVER COIN-BROOCH, CANTERBURY ($\frac{1}{2}$).
(Obverse and reverse.)

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division being **ME AH**, as on the Cuxtone brooch below, while the well-known ring of Ethred has **MEC AH**. The commemoration of the artificer is not uncommon at this period : for instance a brooch¹ found in Northumbria has the name of the owner Aelchfrith and that of the maker Gudrid, while the legend on the Alfred brooch is quite in keeping. An analysis of the floral panels suggests the same date for the knife as that deduced from the forms of some of the letters ; in the latter half of the ninth century this style of decoration was evidently in vogue, witness the silver bands included in the find at Trehiddle, St. Austell, Cornwall, which dates from about the year 875.² The name Sigiberht occurs as that of the moneyer on coins of Cuthred, who reigned in Kent 798–805 ; and the closest parallel for some of the letter-forms is afforded by coins of Archbishop Plegmund (891–923).

A remarkable openwork brooch³ of silver, now in the British Museum, was found at Cuxtone about 1814, and belongs to a small but interesting class of late Anglo-Saxon antiquities. It is 1·3 inches in diameter, and has in the centre an eagle battling with a dragon, while round the border is engraved the legend **ÆLFGIVV ME AH** (Aelfgivu owns me). The formula is a common one, and it will be remembered that the Alfred jewel, for instance, has the older form (**MEC**) of the pronoun⁴ ; it was also pointed out by Prof. Geo. Stephens⁵ that the presence of such words in a conspicuous position shows that such jewels were made to order, and probably for persons of high estate. It is quite possible, therefore, that this brooch belonged to her who was also called Emma, first the wife of Aethelred the Unready (m.1002), then of Cnut. Her death took place in 1052, and the style of the work would agree well with what is known of the early eleventh century. The name was a common one, and occurs on the Bayeux tapestry.

MISCELLANEOUS ANTIQUITIES

ADISHAM.—See p. 343.

ASH.—See p. 353. Warrior's grave discovered 1783 : head SW., shield-boss near left breast with two bracers and studs, spear-head 9½ inches on shoulder, iron knife 5 inches long at side, and dark-grey pottery bottle, 9 inches high, at feet [*Nen. Brit.* p. 93 ; bottle pl. xxiii. fig. 3].

At Knell, in this parish, was found a gold coin of Theodebert, King of the Franks (sixth century), wt. 23 grains [*Coll. Ant.* i. pl. xxii. fig. 6].

ASHFORD.—Olive-green glass drinking-cup with three rows of hollow lobes, 9½ inches high, found with skeleton and weapons : British Museum [*Inv. Sep.* p. xlv].

BARFRETON.—See p. 349.

BARHAM DOWN.—Blackish jug of Frankish type : Canterbury Museum [*Coll. Ant.* ii. 220, pl. lii. fig. 5].

BEAKESBOURNE.—See p. 343.

BELMONT.—A square-headed brooch of Jutish type, inlaid with garnets, with cruciform design on foot, now at Canterbury, seems to have been found here, 3 miles S.W. of Faversham [*Coll. Ant.* ii. 163, pl. xxxvii. fig. 5].

¹ Stephens, *Runic Monuments* p. 386. ² *V.C.H. Cornwall*, i. p. 378, fig. 8 ; *Proc. Soc. Antiq.* xx. 47.

³ *Arch. Journ.* xii. 202 ; *Journ. Brit. Arch. Assoc.* i. 327.

⁴ Instances in *V.C.H. Worcs.* i. 233.

⁵ *Northern Runic Monuments*, ii. 586.

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BIFRONS.—See p. 342. Silver finger-ring, attributed to late tenth century, but, from description, probably of fifth century, with pellets on bezel like Sibertswold ring figured *Nen. Brit.* pl. xxii. fig. 4 [*Proc. Soc. Ant.* 1st Ser. i. 173].

BIRCHINGTON.—Silver coins (*sceattas*), weighing 18 grains, in Mayer Collection, Liverpool [*Coll. Ant.* i. 64, pl. xxiii. figs. 2-4 (fig 5 is bronze plated); *Arch. Cant.* viii. 172].

BISHOPSBOURNE.—See p. 344.

BORDEN.—Two graves were found in 1882 near Chalkwell, Sittingbourne, one containing two dark amber-coloured glass cups of tumbler form (British Museum) on either side of the skull; near them was the bronze handle of a bucket [*Proc. Soc. Ant.* ix. 162; Payne, *Coll. Cant.* III].

BOUGHTON-ALUPH.—Two male skeletons found 1719-20, one with large iron sword, the other with conical shield-boss, and penannular brooch or bracelet [Lord Winchilsea's note in *Nen. Brit.* pl. xxv. No. 2, and p. 121].

BOUGHTON-UNDER-BLEAN.—In wayside hedge near the Parsonage barn a male skeleton was found in 1716 with an iron sword in fragments and a coin of Antoninus Pius [Hasted's *Kent* (Harris, 8vo, 1798) vii. 4; Lewis, *Hist. of Faversham*, p. 86].

BOURNE PARK.—See BISHOPSBOURNE.

BREACH DOWNS.—See p. 348.

BUTTSOLE.—See pp. 351, 352.

CANTERBURY.—See pp. 341, 382. The gold bracelet found in the neighbourhood in 1860 was probably Roman; remains of two skeletons and many bones of horses in the vicinity [*Proc. Soc. Ant.* 2nd Ser. i. 184].

In field near the Dane John, skeletons found in 1860: bronze armlets, ivory pin, green glass beads and bone discs in grave N.W. by S.E.: other graves with same direction, except two with head at the east end: hollow iron nails (of coffin?) also found, but all apparently Roman [*Proc. Soc. Ant.* 2nd Ser. i. 330].



FIG. 28. ENAMELLED
GOLD FINGER-RING,
CANTERBURY (†).

Gold finger-ring, the bezel $\frac{1}{2}$ inch diameter, with border of gold pellets (some missing), and in centre fine gold cell-work representing a bird's head on blue enamel ground, which is imperfect: triple pellets on hoop flanking the bezel. Figured by permission of the owner, Mr. W. C. Trimmell [John Brent, *Canterbury in the Olden Time*, 2nd ed. pl. 9, fig. 5, p. 30].

The gold bracteate in the Chapter library was probably found in the neighbourhood [*Pag. Sax.* xi. 2].

CHALKWELL.—See BORDEN.

CHARTHAM DOWNS.—See p. 369.

CHATHAM.—See p. 375.

CLIFFE-AT-HOO.—See p. 377.

COOMBE.—See p. 355.

CRUNDALE.—See p. 367.

CUXTONE.—See p. 383.

DOVER.—See p. 379. Jug of Frankish type, from a barrow near the town: Dover Museum [*Coll. Ant.* ii. 219, pl. lii. fig. 1].

Gold *sceatta* of 21 grains found near the town [*Coll. Ant.* i. pl. xxii. fig. 9].

A fine circular brooch, nearly $2\frac{1}{4}$ inches diameter with inlaid garnets and gold filagree, of same type as pl. i. fig. 17, found with large amethyst beads and silver earrings; also bronze mount of bucket found towards Sandgate [*Arch. Journ.* viii. 177: all British Museum].

During excavations for houses on Priory Hill in 1889, fragments of swords and spears, with limpet-shells and jasper stones found in graves: Dover Museum [*Coll. Cant.* p. 199]. A jewelled brooch with star centre (as pl. i. fig. 1) also from Priory Hill: silver-gilt lip of drinking cup (as fig. 16) embossed with animal design, from the Old Park: bone comb found in Cannon Street, 1880, on the premises of Sir R. Dickeson; and a glass cup (as pl. 2, fig. 8) found 14 feet deep opposite the Grand Shaft, below Shakespeare Cliff: all in Dover Museum.

Sepulchral stone-slab with Runic inscription + GISLHEARD, probably a coffin-lid, found before 1832 during alterations to the Antwerp Inn, on north side of market-place, under the foundations of the former church of St. Peter, and now in Dover Museum. 5 feet 10 inches long, 2 feet $1\frac{1}{2}$ inches broad at head, and 1 foot $7\frac{1}{2}$ inches at feet [*Arch.* xxv. 604; Stephens, *Runic Monuments*, i. 465; iii. 865; *Arch. Cant.* viii. 174; Cutts, *Manual of Sepulchral Slabs*, pl. 35, fig. 4].

EASTRY.—See p. 351.

ANGLO-SAXON REMAINS

EYNESFORD.—Roach Smith in 1861 had seen only an iron shield-boss from the railway cutting, but had evidence that weapons, ornaments and a bronze bowl like the Lullingstone specimen had also been found [*Arch. Cant.* iii. 36].

FAVERSHAM.—See p. 370. In 1853 part of a skull and a tumbler of green glass, 2½ inches high, were found in digging a grave in a churchyard [*Jour. Brit. Arch. Assoc.* xiii. 313].

A grave N.W. and S.E. was found in the King's Field early in 1874, containing brooch, 1½ inches diameter and openwork gold bracteate, 230 beads and other relics: another grave in same direction not far off contained a fine sword and bronze-gilt buckle (fig.): below the sword a whetstone, 2 inches long, and trifles thought to have been inlaid in sword-guard [*Proc. Soc. Antiq.* vi. 380].

FOLKESTONE.—See p. 364. Nine graves found in 1889 three-parts up hill towards Dover: with skeletons were spear-heads (Dover Museum), beads, buckle, etc. [*Coll. Cant.* 199]. A number of similar graves were found about the same site early in 1907: among the finds, which are in Folkestone Museum, was a keystone brooch, beads and several spear-heads. [To be published in *Arch. Cant.*].

GILTON.—See p. 353. Bronze-gilt hairpin of elaborate (probably Roman) work, found in a grave by Mr. Kingsford, and presented to Canterbury Museum by Mr. John Brent, jun. [*Coll. Ant.* ii. 164, pl. xxxvii. fig. 3].

An iron spear-head, over 18 inches long, was found with parts of an urn in a grave [*Jour. Brit. Arch. Assoc.* xv. (1859), 290], and a metal tag for a strap, from the Faussett collection is figured by Akerman [*Pag. Sax.* pl. xxxv. fig. 9].

GODMERSHAM.—Skeletons found before 1720, one with an iron sword [*Nen. Brit.* p. 121].

GRAVESEND.—See p. 381.

GREENWICH.—See p. 379.

GROVE FERRY.—Antiquities exhibited in 1894 by Col. Copeland included two iron bosses and sword pommel inlaid with silver [*Proc. Soc. Ant.* xv. 178]; also a bronze weight of 575 grains [*Proc. Soc. Ant.* xvi. 174: British Museum].

GUSTON, near Dover.—Probably in this parish were found, on breast of skeleton in a stone cist or coffin, a circular brooch with shell-boss in centre, three garnet settings and niello border, shield-boss, iron sword and spear-head 15½ inches long: now in Leeds Museum. [*Arch. Jour.* xxi. (1864), 101].

HIGHAM.—A few spear-heads and fragments of a bronze bowl with the lip thickened and turned inwards were found at the Lower Shorne Uralite works in 1905 [Collection of Mr. Geo. M. Arnold, F.S.A.].

HOLLINGBOURNE.—See WHITEHEATH.

HORTON KIRBY.—See p. 377.

HOTH.—Cup of green glass, with rounded base and threaded neck, found about 1772 with human bones and a bottle (which was broken) in gravel-pit at Mill Bank: now in British Museum [*Pag. Sax.* pl. xxv. fig. 2].

HYTHE.—Old quarries N.W. of town marked as site of Anglo-Saxon finds in 1870 on Ord. Map, lxxiv.

ICKHAM.—Square-headed and 'button' brooches (pl. i. fig. 15), etc., mostly of Jutish type [British Museum].

KINGSTON DOWN.—See p. 345.

LITTLEBOURN.—Gold sceatta of 21 grains [*Coll. Ant.* i. pl. xxii. fig. 10].

LULLINGSTONE.—See p. 378.

LYMINGE.—See p. 364.

LYMPNE.—See p. 364.

MAIDSTONE.—On site of Lancastrian School, Wheeler Street, discoveries in 1823 [*Arch. Cant.* i. 166] and 1836 [*ibid.* xv. 72]: skeletons and weapons found on east side of street [*Arch.* xxx. 535], also brooch with T garnets, shoe-shaped stud, bronze wheel ornament of five spokes, and wire bracelet [Maidstone Museum]. A bronze wheel, apparently from the same mould was found at Leatherhead [*Surrey Arch. Collns.* xx. 124].

MERSHAM.—Bronze buckle and oblong buckle-plate set with garnet and incised [*Coll. Ant.* ii. 163, pl. xxxvii. figs. 2, 6, 7: Cant. Mus.].

MILTON-NEXT-SITTINGBOURNE.—See p. 374.

MINSTER.—Human bones found 7 feet from surface of churchyard, and subsequently the skull with bell-shaped glass cup ornamented with vertical ribs: the skeleton said to have measured nearly 8 ft. long [*Archaeologia*, viii. (1786) 449; *Nen. Brit.* pl. xvii. fig. 4, p. 71].

MONKTON.—Skeleton found with knife at side, presumably of Anglo-Saxon date, on

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Primrose Hill, about 1880 (Kelly's *Guide to Thanet*, p. 46). Primrose Hill is a cart-track joining the main-road and the bye-road to Minster.

NEWINGTON MANOR.—Three burials found in 1760 at Hythe below hedge of highway across Milkey Down; two with coffins, and all containing beads of glass and amethyst, some on earrings [Hasted's *Kent* (Harris, 8vo, 1799), viii. 199].

NORTHFLEET.—In 1847 discoveries were made during railway excavations: few details recorded, but illustrations given by Roach Smith of spears, shield-boss and handles, knife-sword, bucket and Roman pottery [*Jour. Brit. Arch. Assoc.* iii. 235]. The handle of a sword found here was of pine [*Coll. Ant.* iii. 7].

During excavations on the chalk hill east of the football-ground an Anglo-Saxon burial-ground was discovered in 1899. Twenty skeletons lay 3 ft. deep, the graves not being cut in the chalk rock, but the bodies lying on the gravel bed, east and west; with them were two swords and several spears, bosses and handles of shields, also two openwork studs for the shield in animal form, bronze bowls with embossed rims, beads, draughtsmen of glass, an iron axe-head of francisca type, two small saucer-brooches and four cinerary urns of Anglian character, as well as fragments of others. Both the brooches and urns with cremated bones are rarities in Kent, and the occurrence of cineraries here lends colour to the alleged instances at Folkestone and Coombe (pp. 355, 364) [Collection of Mr. Geo. M. Arnold, F.S.A.].

OTTERHAM CREEK.—See p. 375. Amber bead 3 in. in diameter and $1\frac{1}{2}$ in. thick at centre found in an Anglo-Saxon grave [*Coll. Cant.* 86].

OZINGELL.—See p. 362.

PATRIXBOURNE.—See p. 342.

POSTLING.—Small brooch with keystone garnets [*Inv. Sep.* pl. ii. fig. 3], and pair of belt-rivets, found 1773 [pl. viii. fig. 14].

RAMSGATE.—Near Three Mills, Roman urns with calcined bones found about 1846 in proximity to Saxon swords placed beside skeletons: collection of Mr. Tomson [*Jour. Brit. Arch. Assoc.* ii. 281]. The site is near the junction of West Cliff Road and Grange Road.

RECVLVER.—See p. 361.

RICHBOROUGH.—See p. 361.

RINGWOULD.—See p. 363.

ROCHESTER.—See p. 376. Site of Anglo-Saxon discoveries in 1892 south-west of St. Margaret's Church marked on Ord. Map, xix.

In 1852-3 about twenty skeletons found on Star Hill, near Eastgate: relics included keystone brooch, rectangular buckle-plate, Roman armlet, five spear-heads, and beads of glass and amber [*Jour. Brit. Arch. Assoc.* ix. 407, pl. 32; *Coll. Ant.* iii. 209, pl. xxxiv].

St. MARGARET'S.—See p. 363.

St. MARTIN'S.—See p. 341.

SANDGATE.—Bronze mount of bucket found towards Sandgate [*Arch. Journ.* viii. 177; *Coll. Ant.* ii. 161, fig. A: now British Museum].

SARRE.—See p. 357. Two iron discs, spear-heads and knives, with part of a bucket from graves found 1868: British Museum, from Durden collection [*Proc. Soc. Antiq.* xiv. 312].

SHEPHERD'S WELL=SIBERTSWOLD.—See p. 350.

SITTINGBOURNE.—See pp. 373, 374, 382.

STODMARSH.—See p. 357.

STOWTING.—See p. 365.

STROOD.—See p. 376.

TEYNHAM.—See p. 373. In 1888 workmen excavating for brick-earth found a sword and beads, and on another occasion an urn, beads and a knife, doubtless from Anglo-Saxon graves [*Coll. Cant.* 114, 198; *East Kent Gazette*, 17 March, 1888]. Three fine circular brooches, beads, armlet, buckle, iron key and amber glass; also iron spear, shield-boss and sword, found in 1889 [*Proc. Soc. Antiq.* xiii. 190].

THANET.—Among several coins found in the island was a novel variety of penny of Aethelheard, Archbishop of Canterbury, in conjunction with King Offa [*Jour. Brit. Arch. Assoc.* i. (1845), 149].

In 1847 Lord Holmesdale exhibited a gold brooch, found in 1841 and attributed to the ninth or tenth century, but 'set with pieces of coloured glass, tastefully arranged' [*Arch. Journ.* iv. 164]. Two glass beads of chevron pattern, said to have been found in a grave on North Down, and others of the same kind ploughed up [British Museum].

WALMER.—See p. 363.

ANGLO-SAXON REMAINS

WESTWELL.—Objects found during 1858 included fragments of large bronze bowl, in Thurston collection [*Arch. Cant.* i. 43, 47].

WHITEHEATH, HOLLINGBOURNE.—Sixty-five glass beads found near Anglo-Saxon weapons and skeletons, 1847 [*Jour. Brit. Arch. Assoc.* iii. 248, 323].

WICKHAMBREUX.—See p. 356. Swords and shield-bosses in collection of Mr. Geo. M. Arnold, F.S.A.

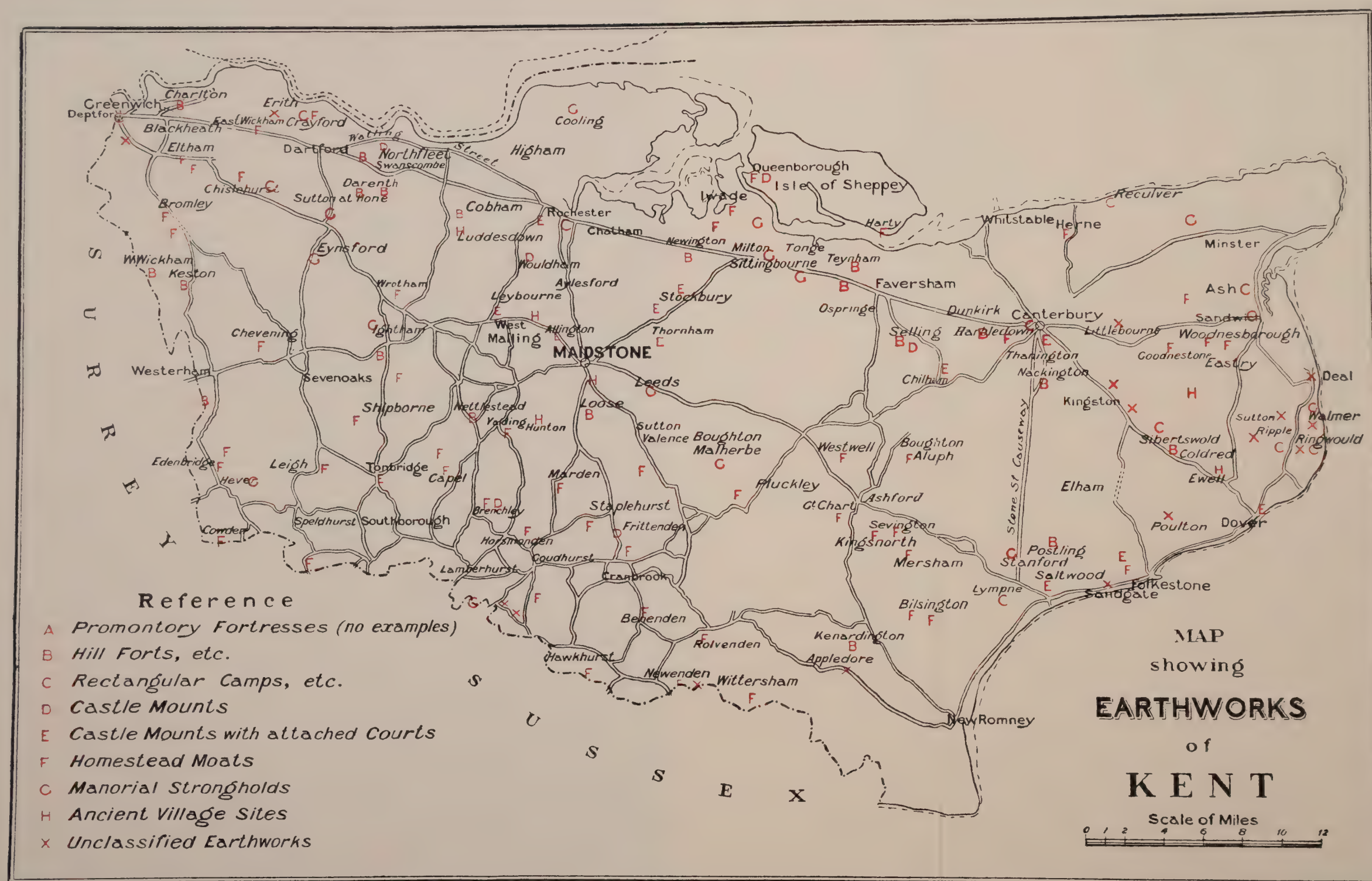
WINGHAM.—See p. 356.

WOODNESBOROUGH.—See p. 352. Jug of coarse bluish pottery, of Frankish type, 8 inches high, found in sand-pit behind the *Oak Inn*, with circular jewelled brooch : formerly in Rolfe Collection [*Coll. Ant.* ii. 220, pl. lii. fig. 4].

About 1514 a fine gold coin weighing about 12 shillings was found in Ringleton Field. It had a loop of the same material, and on one side the figure of a young man in armour (bust of an emperor, probably of fifth century), with spear over right shoulder : on the reverse, a figure of Victory with sword in hand point downwards (probably a cross) [Hasted's *Kent*, x. (8vo) 124]. The coin was evidently a *solidus*, weighing 60–70 grains.

WYE.—Grave discovered in 1858 at foot of the hill on the Dover road, about one mile from Wye, containing a male skeleton, shield-boss, sword, glass cup and smaller objects [*Gent. Mag.* 1858, ii. 65]. A spear-head is mentioned in *Arch. Cant.* i. 47.

WYE AND CRUNDALE DOWNS.—See p. 368. Four gold pendants of different patterns (one of bracteate character), carbuncle setting, parts of silver brooch, iron knife and spear-head ; also a glass cup with a blue thread in loops : British Museum [*Proc. Soc. Antiq.* xiv. 314].



ANCIENT EARTHWORKS

INTRODUCTION

KENT, the main gateway of Britain from the Continent, might well be expected to yield abundant evidence of its occupation in early days, but so far as defensive works are concerned the expectation is not realized, and we look in vain for more than fragments of banks and trenches of long pre-Roman date; indeed we find few works of note appertaining to times anterior to the days of feudalism, when the castles of which Kent possesses such valuable examples were constructed.

The paucity of early remains may be attributed to various causes—

1. A large portion of the district was included within the area of the dense forest of Andred, a tract of country long uninhabited, stretching from the west through the Wealds of Sussex and Kent.

2. The resistless action of the sea has changed and shifted the divisions between land and water on the east and south-east of Kent, and destroyed much of the chalk headlands of the northern and north-eastern cliffs, thus, perchance, carrying away promontory fortresses such as we find where the coast-walls of England are of harder rock.

3. Between the ridge of the North Downs and the present line of the Thames numerous evidences of early occupation have been discovered in excavations, but all traces of them on the low-lying land near the waterside are now buried under some feet of silt.

4. Diggings on the sides of the Watling Street, that great highway of the Roman and later conquerors, have proved the large extent to which its neighbourhood was occupied, but neither along it nor on the earlier trackway, known as the Pilgrim Way, do we find much evidence of earthworks; for just as Kent was the first to receive those civilizing influences which came from the East, so through Saxon and all subsequent days it has been (excepting in the Weald where the development was late) one of the most cultivated of England's counties, consequently agricultural operations, road making, building, etc., have combined to destroy the rampart and fosse used in early defence.

Notwithstanding the attention which in recent years has been devoted to the study of ancient earthworks and defensive enclosures in Britain, it is impossible to classify them in perfect chronological order; nor is there any hope of accomplishing this desirable end until careful and scientific exploration is made and properly recorded.¹

¹ Hasted gives us a warning which is à propos. After referring to Philemon Holland's words, in his edition of Camden's *Britannia*, relating to an entrenchment at West Wickham, the Kentish historian says: 'In the same manner there are many other places in this county, which may seem to have been

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Recognizing our limitations it is thought preferable to adopt the scheme published by the Congress of Archæological Societies, and classify the defensive enclosures of a district by form rather than to attempt a strict chronological order.¹

Of earthworks classed under B, Oldbury, in Ightham, and Holwood in Keston, are the most important but mutilated remains, both probably of Celtic construction. Other examples of that period are in even more fragmentary condition.

Of Roman work we have more complete evidence, but being mostly written in stone, as at Richborough, Reculver and Lympne, its record belongs to another chapter.

Entries in the Anglo-Saxon Chronicle lead to the hope of discovery of remains at Appledore, Milton, and elsewhere, but we seek in vain for definite traces.

Artificial, or partly artificial, defensive mounts, with fosses around them, abound in England, mostly provided with one or more courts or baileys attached to them. Much discussion has arisen as to their date, but opinion in the archæological world is settling down to the theory of Norman origin for the vast majority of examples, though some appear to have existed in the time of Edward the Confessor, and fossed mounts, without courts, possibly earlier. It must not be forgotten that when first thrown up, artificial mounts of earth were incapable of sustaining the weight of stone structures, and must therefore have been dependent upon wooden defences such as are shown on the Bayeux tapestry. Some half-dozen Kentish examples of these feudal strongholds show simple mounts with encircling fosses, without traces of attached courts (class D), though the latter may have existed and been destroyed. Of those with baileys adjoining the mounts (class E) Tonbridge presents the finest example in the county.

Manorial holdings and others, of class G, are well represented in Kent, some possessing strong castles of stone, probably the successors of earlier timber structures.

camps and intrenchments made in more antient times, tho' (*sic*) in reality they will be found to be of a much later date; among them are several which were made by the Lord Cobham, Lord-Lieutenant of this county in that reign [Elizabeth], in pursuance of orders sent to him to make trenches, etc., in those places, where the enemy was most likely to land.'—*Hist. Kent* (1778), i. 112.

¹ The following classification is recommended in the Scheme and its Appendix :—

- A. Fortresses partly inaccessible, by reason of precipices, cliffs, or water, additionally defended by artificial works, usually known as promontory fortresses.
- B. Fortresses on hill-tops with artificial defences, *following the natural line of the bill* ;
Or, though usually on high ground, less dependent on natural slopes for protection.
- C. Rectangular or other simple enclosures, including forts and towns of the Romano-British period.
- D. Forts consisting only of a mount with encircling ditch or fosse.
- E. Fortified mounts, either artificial or partly natural, with traces of an attached court or bailey, or of two or more such courts.
- F. Homestead moats, such as abound in some lowland districts, consisting of simple enclosures formed into artificial islands by water moats.
- G. Enclosures, mostly rectangular, partaking of the form of F, but protected by stronger defensive works, ramparted and fossed, and in some instances provided with outworks.
- H. Ancient village sites protected by walls, ramparts or fosses.
- X. Defensive works which fall under none of these headings.

ANCIENT EARTHWORKS

Homestead moats (class F) were usually constructed by the simple expedient of digging a deep, wide fosse around and throwing the material inwards, thus raising the island, or enclosed space, above the level of the surrounding land; occasionally we find the enclosures divided by ditches or water moats into two or more islands, and sometimes provided with additional defences much partaking of the character of works classed under G.

Homestead moats were constructed so late as the 16th or 17th century, but the majority are of far greater age; some indeed may be survivals from the days when Saxon settlers needed protection as well from raiders as from wolves and other denizens of the vast forests, scarcely less dreaded than human foes.

We have placed the low-banked, shallow-ditched enclosures under class H, as 'ancient village sites,' but do not commit ourselves to the positive assertion that such was their purpose.

Various works of doubtful origin and uncertain purpose are placed in class X, where will also be found reference to the unique earthworks at Lesnes (Erith), to the puzzling remains known as Castle Toll (Newenden), and to some later defensive works.

Mr. T. V. Holmes contributes the fullest account of the mysterious 'Deneholes' which has appeared, and Mr. F. C. J. Spurrell describes the 'Embankments of the Thames,' a subject of which he has made a special study.

The Rev. H. L. Beardmore of Ripple has kindly devoted time to the examination of various reputed camp sites; Mr. F. C. J. Spurrell, Mr. Harold Sands, Mr. George Clinch, and Mr. J. H. Allchin of Maidstone Museum, have afforded information through their published works or private letters; Captain A. M. Henniker, R.E., has examined sites of camps near Canterbury; and Mr. W. H. St. John Hope has made valuable suggestions. Thanks are due to these gentlemen, and especially to Colonel O. E. Ruck, R.E., for plans of works unrecorded in the Ordnance maps and for many a journey made at the writer's request, journeys which sometimes resulted in the discovery that the 'camp' described and pictured by some old writer was but an antiquary's dream! Needless to say, ample use has been made of Mr. George Payne's laboriously compiled schedule.¹

Although some fragments of earthwork enclosures and of homestead moats are not included in the following pages, it is nevertheless hoped that no remnant of importance is omitted.

HILL FORTS, ETC.

[CLASS B]

BIGBURY.—See HARBLEDOWN.

CHARLTON, NEAR WOOLWICH: THE CAMP.—The hill of sand and marl on which this camp stood has been and is being so extensively

¹ Archaeological Survey of Kent. *Arch.* (1889), li.

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removed in the process of enlarging the vast sand pits that a mere fragment of the defensive earthwork can be traced.

Just enough remains to-day to indicate that the bold hill, commanding the valley of the Thames, selected by the Britons, or Romans, as the site for their strong fortress, was steeply scarped for some 15 ft. down, and at the foot of the scarp surrounded by a rampart.

On the south-west a piece of a second or outer rampart remains, which probably extended all round the camp, but met with the excavator's pick earlier than the inner rampart.

Even of the inner rampart only a few more yards remain than of the outer, and these must shortly disappear to be replaced by the floor of the great pit, at 60 ft. or 70 ft. lower level.

A week or two before the writer's visit, two nearly perfect vases and one broken vessel of the Romano-British period were found on the slope of the rampart when digging it away.

COBHAM : COBHAMBURY WOOD.—On high ground commanding an extensive view eastward, above the road from Cobham to Cuxton, are traces which may appertain to a hill fort. Mr. George Payne considers the 'ramparts' to be the outlines of an extensive oppidum, some 300 yds. square,¹ but the rampart seems in places to be very meagre, more a terracing of the slope than a bank, and the trenches die out. The thick growth of timber and underwood renders it very difficult to form an opinion as to the extent of artificial work.

COBHAM : COBHAM PARK OPPIDUM.—This work is very similar to certain Celtic strongholds, usually hill forts, to be found in various parts of the country. A work, for example, of a like character is that of Castel-y-Gaer, Llwyngwrl, Merionethshire, which has a lunar defence on the north-east side and is constructed with a similar rampart, fosse and outer bank facing an ancient road passing across the front.

The rear is undefended owing to the steepness of the approach to the top plateau from that side, and the fosse runs out in the same way to cover ground on both sides as at Cobham.

The work here is exceptionally interesting on account of the good state of preservation of the pits in the fosse such as are common to many hill forts, and are supposed to be connected with the defence of the main entrances, the causeways enabling men to quickly advance and return to and from the ramparts.

A doubtful point is the defence of the west side. In other cases a defended annexe for cattle in British works, or for camp retainers in the case of the Roman forts, is sometimes found on the protected flank, away from the probable direction of attack. The mound where the water gauge now is may have been an annexe, but the remains are too vague to suggest a definite conclusion.

The only piece of possible Roman work is the straight trench on the west side, but as it may be comparatively recent nothing can be authoritatively stated as to this.

¹ *Coll. Cantiana* (1893).

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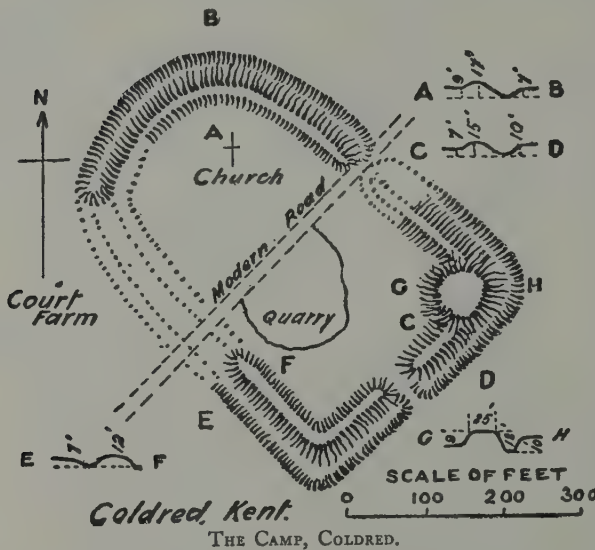
Whatever the date of its origin is, there can be no question that this is an interesting work, worthy of the care bestowed upon its preservation by the present Lord Darnley.

It is situated on the northern skirt of Cobham Park within about 450 ft. of Watling Street, and is largely covered with timber.

Old workings for sand have much destroyed the southern slope of the hill.

COLDRED CAMP.—The church stands within the lines of an ancient fortress, which is about 370 ft. above sea-level, and 50 ft. above a valley a quarter of a mile westward. The entrenchments consist of a fosse with the ballast thrown inward to form a rampart, the whole of some power, but not in a good state of preservation. An ancient well is said to have been found when cutting the modern roadway which bisects the enclosure. It has been

claimed that Ceoldred, King of Mercia, fought near here with Ine, King of Wessex, in 694, and gave his name to the place, but as various relics of Roman age have been found, it is perhaps not unlikely that the fortress is of the Romano-British period, notwithstanding the peculiar semi-rounded form of the north-western end. Entrance ways remain on three out of the four positions usually adopted for that purpose in Roman



man castrametation, and one may have existed on the north-west, though not now traceable. Hasted gives an engraving of the fortifications and shows a considerable mount on the south-east side of the modern road but a quarry has destroyed all traces.¹

DARENTH WOOD.—Both on the south-east and south-west sides of the wood are traces of scarping and banking, which appear to indicate the former presence of some sort of defensive work, but the remains are obscure.

HARBLEDOWN : BIGBURY.—About three miles west of Canterbury, the pre-historic track, known as the Pilgrim Way, runs through an enclosure locally denominated Bigberry, or Bigbury Camp.

The Ordnance Survey (25" scale map) shows the course of the principal trenches, but the remains are so hidden by brushwood, and, in

¹ *Hist. Kent* (1799), iv. 1.

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parts, destroyed by gravel diggers, that it is difficult to follow the lines of the work.

Professor Boyd Dawkins thinks that—

The complicated embankments and ditches which circumscribe the area are obviously intended for boundaries, mapping off different quarters, with shallow ditches and low ramps, and are not designed as fortifications,¹

and the Rev. E. A. Downman regards the trenches simply as worn tracks in the soft sandy gravel.

Both views are correct as to part of the works, but the plan and measured section published by the late R. C. Hussey, F.S.A., indicate earthworks of a strongly defensive character on the south-west,² and two competent military engineers, who have recently examined Bigbury, found sufficient evidence to satisfy themselves that it was a defended oppidum, and that its principal portion was originally protected by two ramparts with an intermediate fosse.³ They write :—

The main work is situated on a plateau averaging some 230 ft. above sea-level, resting on a bed of gravel overlying the dry Thanet sands ; it overlooks the valley of the Stour to the south, but is divided from the heights of Harbledown to the north by a broad valley.

Its internal area within the ramparts measures about 1,000 ft. east to west and varies from 500 to 1,000 ft. from north to south, and closely follows the 200 contour line. A crescentic defended annexe (possibly for cattle), strengthening a vulnerable side, is appended to the north-west face ; this slopes rapidly downwards to a much lower level ; its measurements are about 1,000 ft. from east to west, and 500 ft. from north to south.

The main approaches are on the east and west. The entrance on the east is in continuation of the deep sunk winding Pilgrim Way from Canterbury, and is the more interesting owing to the two deep tracks which appear to have been used successively, as the previous track got impracticable, the most southerly being the deepest by some 10 ft. ; it is considerably lower than the line of entrenchments which it penetrates, about 25 ft. below the bank on its southern margin, and must be the oldest of the alternative exits on this eastern side.

By comparing numerous relics discovered here with those found in certain settlements of a known period, Professor Boyd Dawkins concludes that Bigbury is of the Prehistoric Iron Age, belonging to a period ranging from one to two centuries before the invasion of Britain by Cæsar.⁴

The close relation of this work to the British track, now called Pilgrim Way, adds materially to its archæological interest.

IFFIN WOOD.—See NACKINGTON.

IGHTHAM : OLDBURY.—This ancient earthwork is on a bold hill varying in height from 600 ft. on the south to 400 ft. on the north. The position is naturally strong upon the south, and to a limited extent at other points, but the extreme north and north-east is practically level, and has no natural defence. The land in the neigh-

¹ *Athenæum*, 24 May, 1902.

² *Arch. Cant.* (1874), ix. 'The British settlements in Bigbury Wood, Harbledown.'

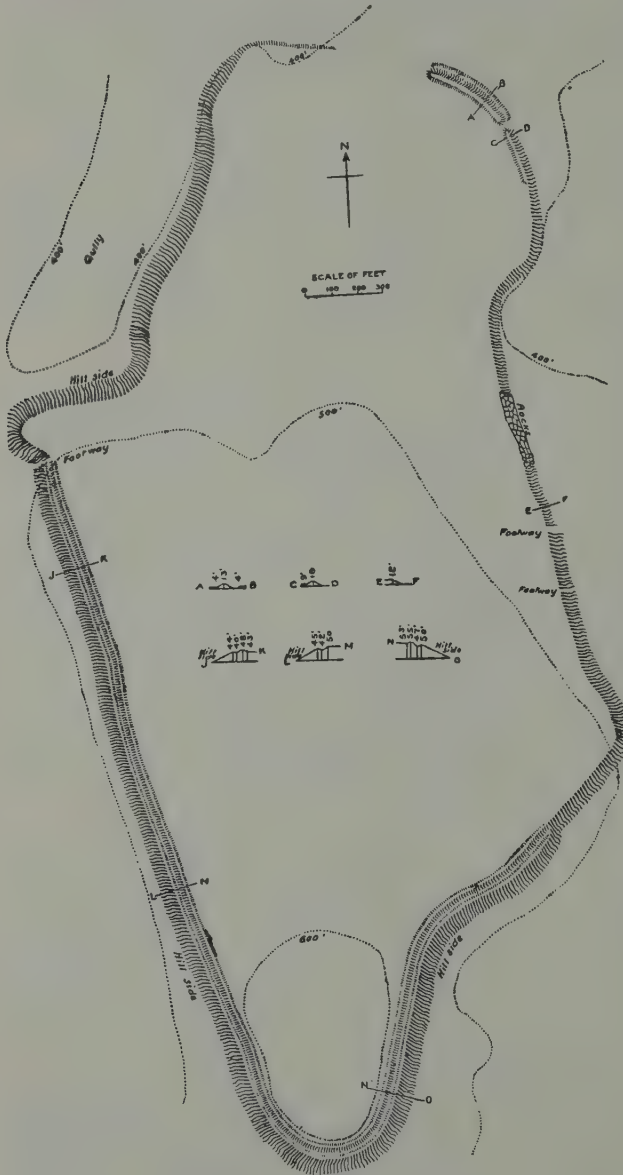
³ The much-to-be-deplored gravel digging has disclosed a section of the filled-up fosse on the south-west, where it might be expected to have existed, but, naturally, was not shown on the O.S. maps, as it was not visible.

⁴ *Arch. Journ.* (1902) lix.

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bourhood is undulating, in many places reaching a greater height than this hill. The entrenchments consist of a fosse with the ballast thrown inward to form a rampart, of no great power at any point, constructed

with little regard to natural defences. For instance, at the section A-B in the north-east, where the land is level, the barricade is but a ditch and rampart, perhaps rather wider in base and better defined than the ditch and rampart of the part cut by the section J-K, where the hill-side forms a natural protection, yet it is but a single entrenchment where we should expect to find a much stronger defence. The work is in a very poor state of preservation, the north portion generally being under cultivation, while the south part of the enclosure, together with the sides of the hill, is covered with timber and underwood, and is exceedingly difficult to examine. As a stronghold it is of no great strength, but it is large, and should be compared



OLDBURY CAMP, NEAR IGHTHAM

with Borough Hill, Northamptonshire ; Hamdon Hill, Somersetshire ; and Nottingham Hill, Gloucestershire.

The handiwork of neolithic man has been found in caves and on slopes on the skirts of Oldbury. Hence some have claimed a like remote age for the 'camp,' and, indeed, we have no proof to the contrary.

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JUDD'S HILL.—See OSFRINGE.

KENARDINGTON.—The casual visitor to this neighbourhood would find it hard to realize that in ancient days the main stream of the Rother flowed north of the Isle of Oxney, leaving a tidal estuary south and north-east of Appledore, and finding its way to the sea at Romney.¹

On the shore of the estuary referred to was placed the camp, within which Kenardington church now stands.

The fragments of this camp are poor in the extreme ; of its eastern side there remain 600 ft., but it evidently extended southward into the adjoining arable field, where it has been ploughed out of sight, while the piece still visible is no more than an eight foot scarp on the slope towards the valley.



The destruction of the southern extension is greatly to be regretted, as, according to the view given by Hasted, it presented interesting features ; the rampart was carried in a loop up the slope, evidently to cover the access by water from the sea ; and below, near the stronghold, is shown a low mount and causeway, the latter seemingly leading to a similar but larger mount in the marsh below.²

¹ See M. Burrows, *Cinque Ports* (1895), and in further confirmation of the changed conditions may be mentioned the statement that so late as the sixteenth century a Spanish vessel found its way to the shore and bombarded Kenardington Church. Tradition tells of the discovery of a boat beneath the soil in the now dry valley.

² See E. Hasted, *Hist. of Kent* (1790) iii. We are inclined to think the mounts and 'causeway' later than the stronghold, and possibly part of a dam used in 'inning' the marsh land.

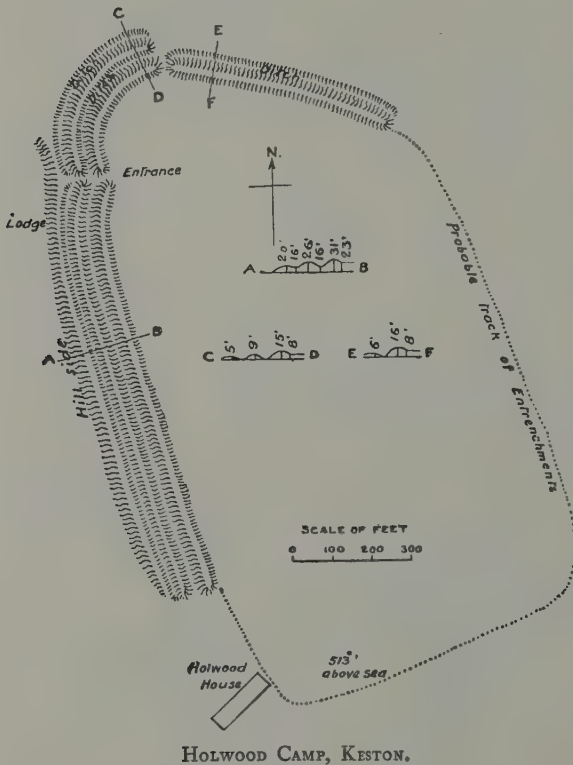
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The northern arm (about 550 ft. in length) is a trifle better preserved, but it is not evident how much further it extended towards the west, as the scarping on that side (shown on plan) may be comparatively recent work, and the opening in the rampart on the north (though it appears an original entrance) may have been made for farm purposes.

Perhaps this camp was never completed, and it may possibly be the Saxon work (*geweorc*) which the Chronicle tells us was stormed in A.D. 893 by the Danes, who found only a half-constructed (*samworht*) fastness in which a few countrymen (*cyrlice men*) were stationed.

KESTON: HOLWOOD.—These entrenchments (about three miles

south-east of Bromley) stand upon undulating ground 450 to 513 ft. above sea-level. The position is to a certain extent naturally defended on the west by a gully, and beyond that by a ridge some 15 to 20 ft. high forming a natural rampart. On the north there is a gentle slope outside the earthworks, which command an extensive view north-west. The entrenchments consist of two fosses dug in sandy clay and gravel, with their ballast thrown inward to form two ramparts, a third rampart being formed on the west by the counter-scarp of the outer fosse. Beyond a rampart and fosse on the north, there is no



HOLWOOD CAMP, KESTON.

trace of further entrenchments to form a complete enclosure, and Holwood House with its garden no doubt destroyed the southern continuation of the earthworks. Comparing the mode of entrenching with other existing works of the same construction, such as Clare 'Camp' in Suffolk and Cholesbury in Bucks, the track of the east and south sides should be as shown on the plan.¹ No doubt in the perfect condition of the work the fosses were much deeper and the ramparts higher.

This is not the place in which to enter fully into the arguments

¹ The plate in Hasted's *History of Kent* is dated 1775, and thereon it is stated that the 'S.E. part of the vallum has been lately grubbed and levelled.'

ANCIENT EARTHWORKS

for or against Roman origin of this camp, or its claim to be the site of *Noviomagus*, but we may say that the great area of the enclosure seems too large for a Roman military station, while its hundred acres would not be too much to accommodate the families, flocks and herds of a British tribe.

There is abundant evidence of occupation in Roman times, as will be seen in the chapter devoted to the antiquities of that period, but this of course does not prove construction at so late a date.

LOOSE : QUARRY WOOD.—This work of doubtful age, suggesting late rather than early construction, lies partly in the parish of Boughton Monchelsea, on land sloping gently from the south and east, with no special advantage of position. It may possibly be one of those referred to by Hasted, cast up in the sixteenth century.

Quarrying has entirely swept away the traces on the north, and other agencies have broken the continuity of the line on the south-west.

On the east, where the land without is slightly higher than the 'camp,' there is a shallow fosse or ditch outside the rampart, but on the west the

land slopes down from the enclosure, and there is no fosse, as probably would have been the case had prehistoric man constructed the works.

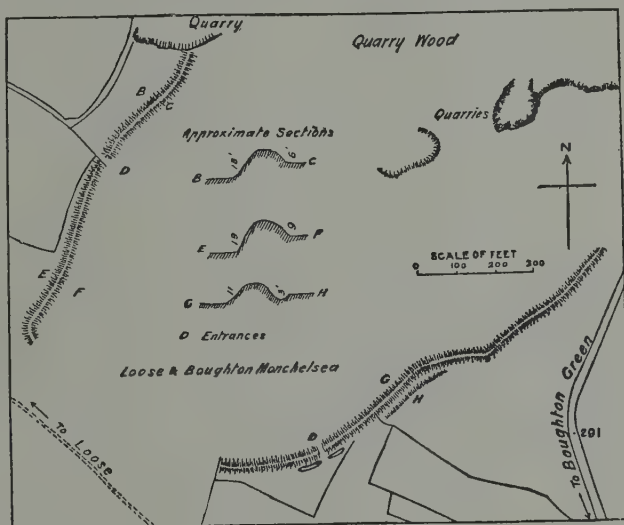
The quarries of Kentish rag-stone are of much value, and must cause further destruction of this earthwork.

NACKINGTON : IFFIN WOOD.—According to Hasted there were in his time vestiges of an ancient camp about eight acres in extent ;

only two acres are level and connected, the rest being cut cross-ways, and in different directions, into several separate mounts and ridges. There are numbers of different intrenchments throughout this large wood, and one *vallum* especially which runs on to the stone-street road.¹

Now the vestiges are so broken and destroyed that it is hard to realize that any true camp or defensive enclosure existed.

NETTLESTEAD : MILBAY'S WOOD.—These entrenchments are six miles south-west of Maidstone, standing about 100 ft. above sea-level and 80 ft. above the river Medway, which flows a mile away to the east.

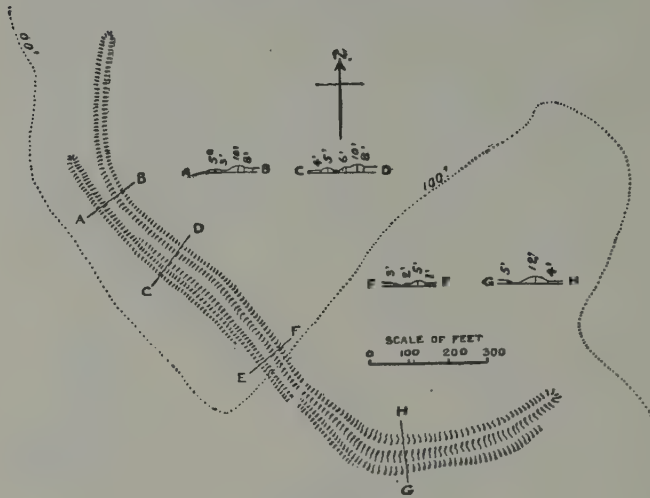


QUARRY WOOD CAMP, LOOSE.

¹ *Hist. Kent* (1790), iii. 728.

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The position is slightly defended on the south-west by the gentle fall of the ground. The entrenchments vary both in width of base and in character without any apparent object, and do not now form a complete



MILBAY'S CAMP, NETTLESTEAD.

enclosure. If ever the entrenchments continued and enclosed a space, such enclosure would have been of large size, but an early stronghold defended by such irregular entrenchments would be unusual. The whole stands in a wood of very marshy nature, drained to a limited extent by water courses. A

cart-track runs between the ramparts or rampart and ditch on the south-west, and on the north, where the western portion of the works may have continued, is agricultural land.

NEWINGTON.—Near Sittingbourne. Keycol Hill has been thought to be the site of a defended Roman station, and vast quantities of pottery of the period have been discovered.

From the description given by Hasted it is evident that traces of defensive work then existed, and that to the south-west there was a rampart with a deep fosse, and a breast-work extending west and north,¹ but of all this little or nothing can now be followed with certainty. The position (on 200 ft. level) is however sufficiently commanding to have afforded a suitable site for a defensive work, and from the height a considerable stretch of the old Watling Street would be under observation.

OLDBURY.—See IGHTHAM.

OSPRINGE : JUDD'S HILL.—When Hasted wrote there were here well-marked traces of a defenced position ; he says, 'A very deep and broad ditch remains on the summit, the south and east sides entire, etc.'² But to-day we find hardly a trace ; scarpings of the hill-side and faint outlines of a fosse here and there, alone remain to tell a tale of the past ; all else has gone, and most of the site is occupied by Syndale House and its park.

The hill affords so good a command of the surrounding country that it may well have been chosen for the site of a fortress in early times, and it has been stated that the Roman Station *Durolevum* was

¹ *Hist. Kent* (1782), ii.

² *Ibid.* ii. 800.

ANCIENT EARTHWORKS

on this spot, but, as the late Roach Smith, referring to the earthwork, said, 'there can, in my opinion at least, be no doubt of its British origin.'¹

POSTLING : TOLSFORD HILL.—At about a mile south-east of the village of Postling are some traces of a camp, mentioned in Petrie's list of Kentish earthworks.²

SELLING : SHOTTENDEN HILL.—Hasted gives a plan of a camp containing about an acre and three-quarters of high ground and states that 'the top is a flat, which seems levelled by art. . . . The form of the entrenchments vary according to the rounding of the hill; the north-east, north-west, and south-east angles are pretty near right angles, but that to the south-west is rounding.'³ He states that the position commands the country on all sides and is well supplied with water.

An examination of the spot shows that, though the traces are difficult to follow, Hasted's description was fairly correct. The wind-mill hill, which he also mentions as being prominent within the area, appears to be a truncated cone, possibly an ancient fort. The entrenchment shown in Hasted's plan is mainly a fosse, cut on the slope of the hill-sides.

SWANSCOMBE : MOUNTS WOOD.—Mr. Spurrell found here the disturbed outline of a defensive enclosure of no great importance.⁴

SWANSCOMBE : PARK.—On either side of what is considered to have been the ancient course of Watling Street, where it crosses the steep hill a mile south of Swanscombe, some 300 ft. above sea-level, are traces of banks and ditches which have been thought to indicate a camp, but the outlines are too vague and indefinite to warrant the assumption.

TEYNHAM : NEULANDS.—Close to the north of Watling Street, at an elevation of 100 ft. above sea-level, is the hill known by this name, once believed to be the site of the Roman station, *Durolevum*.

Of earthwork, rampart and fosse, such as we associate with early defensive enclosures, it possesses none, but the commanding summit has been steeply scarped on all but the southern side, and the upper portion levelled to form a plateau.

The scarping forms a glacis, in places of 15 ft., but on the south the camp seems not to have been similarly treated; possibly the natural slope there was sufficient protection. Though, as stated, no rampart now exists, it is likely that one extended along the top of the scarping, and has been thrown down and spread over the plateau to obtain a better level for agricultural purposes.

WESTERHAM : SQUERRYS.—The late Canon Scott Robertson thus described the interesting earthwork in the park attached to Squerrys Court :—

In the Park, upon very high ground about three-quarters of a mile from the mansion, there is an ancient British *Oppidum*, an earthwork of oval form, which has often been called a Roman Camp.

¹ *Coll. Cant.* (1893) 94.

² *Hist. Kent* (1790), iii. 24.

³ *Arch. Cant.* (1880) xiii.

⁴ 'Dartford Antiquities,' in *Arch. Cant.* xviii.

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It occupies about 11 acres of ground. . . . The inner earthwork is about 20 ft. high on the N.E.; and 12 ft. on the N.W.; but nearly effaced towards the south. The inner ditch is about 15 ft. wide.¹

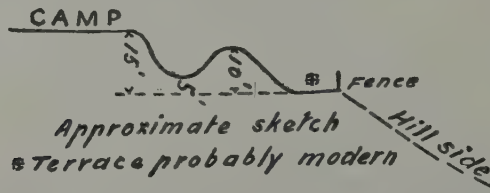
This description and the plan by which it was accompanied give a good idea of the work, excepting that they suggest the existence of distinct raised ramparts with a fosse, whereas the defensive work consists mainly of double scarps of the sides of the steep hill, an upper scarp forming an almost perpendicular bank varying from 12 to 20 ft. in height.

Here and there, however, are traces of a slight bank on the summit of both upper and lower scarps.

General Pitt-Rivers considered the work to be a British *oppidum* (afterwards occupied by the Romans), and its bold position in what was then, and to some extent is now, a thickly wooded region confirms this view of its origin. It is unfortunate that on the south side where, the natural slope being least, most artificial work was needed, the lines of earthwork have been much destroyed.

An ancient trackway leads from the north to the little valley which separates the *oppidum* from the high ground on that side, and apparently continues on the east below the earthworks.²

WEST WICKHAM: CAMP.—On the top of the steep hill-side by which Wickham Common is approached from Hayes Railway Station,



S. W. SECTION. WEST WICKHAM CAMP.

CAMP, WEST WICKHAM.

is all that remains of an earthwork of doubtful origin, oblong in form and about 500 ft. by 400 in size.

A simple fosse of considerable proportions seems to have been the main element of defence, but on the

western side, where it was cut on the steep slope, its outer scarp assumed the form of a rampart (see sketch), while elsewhere, on the level, no rampart remains, even on the inner margin of the fosse, where we should expect to find it.

The western side, which exhibits the best sections of the work, has been mutilated by a great gravel pit.³ From the south-west angle the line passes eastward on level ground, and here we now find but the fosse; this continues along the south side, then turns northward to form the eastern defence, but soon disappears, nor can its traces with

¹ *Arch. Cant.* (1886) xvi.

² Colonel Warde, to whose courtesy the writer was indebted for the opportunity to examine the *oppidum*, says: 'The trackway has always been called the Roman Road, and the land close by is known as Crockham Street.' Of course, though doubtless used by the Romans, the trackway may be of earlier date.

³ As the Corporation of London are now the owners and the land is public, no such mutilation will again occur.

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certainly be followed further, though a slight trench suggests its course on the northern side.

Within the enclosure are two distinct mounts which may be burial tumuli, and traces of a third possibly exist, as well as of another just outside the present entrance at the south-west angle.

The presence of these mounts or tumuli, together with the general form of the earthwork, would lead to the conclusion that we have here a hill fortress of early date, but we are involved in doubt when we read the words of Philemon Holland in the first edition of his translation of Camden's *Britannia*, dated 1610 and evidently written about 1600 :¹—

As for the other small intrenchment not farre of by *W. Wickham*, it was cast in fresh memorie when old *Sir Christopher Heydon*, a man of great command in these parts, trained the country people.

It may be that this is not the work referred to, for its form seems hardly suited to the Elizabethan period, or it may be that Sir Christopher simply threw down ramparts and altered the character of the defences.² Whatever its date may be we are glad to know it is saved from complete destruction.

Traces of fortresses have been noted, by various observers, at the following places, but do not, for the most part, appear to be well defined or of sufficient importance to need description.

Chilham (Penny Pot Wood), Crouch (Great Comp Wood), Ightham (Beech Tree and Wimlet Hills), Littlebourne (Pine Wood), Newnham (W. of valley), Tonbridge (Castle Hill 2 m. S.E. and one near Dry Hill), Waterringbury (Roydon Hill).³

RECTANGULAR CAMPS, ETC.

[CLASS C]

ASH (by SANDWICH) : RICHBOROUGH CASTLE.—Though necessarily mentioned here as one of the ancient defensive works of Kent, all description of Richborough (Rutupiæ) will be found in the article devoted to Romano-British Kent.

CANTERBURY : THE CITY DEFENCES.—Though it is to be supposed that in the days when the Cantii occupied the district there may have been a British settlement on this important site, where ancient ways lead by fords across the river, we have no evidence of defences which can with certainty be assigned to so early a period.

As the Roman town and its defences are discussed in another article, and the mediæval wall is outside our scope, it will be sufficient here to mention the remains of the fosse and rampart which antedated the wall of masonry.

The principal portion left is at the southern angle, where we see

¹ Camden, *Brit.* 326.

² Mr. W. H. Griffin and members of the Catford and District Nat. Hist. Soc. are devoting much attention to the earthwork and its contained tumuli, and may obtain some further light on the origin.

³ Archæological Survey. *Arch.* (1889) li. and *Collectanea Cant.* (1893).

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not only the mediaeval structure, but, below and on the inner side thereof, the earthen rampart, while without is the deep and wide fosse, the ballast from which formed the rampart.

CRAYFORD : CAMP.—Mr. Spurrell states :—

On the spread of gravel 30 or 40 ft. above the creek on its west side, and a quarter of a mile or less due south of Howbury, is the barest outline of an oval camp ; its bank may be feebly traced on the north, and the ditch also here and there.¹

DARTFORD : JOYDEN'S WOOD CAMP.—About three miles south-west of Dartford, on ground rising high above the Thames valley flats, are the remains of this interesting earthwork on a spot which has evidently been occupied in successive ages, some long antedating the period of the rectangular earthwork which is our subject.

The low banking and slightness of the protective work are akin to those we associate with ancient village settlements, but the careful examinations made by Col. O. E. Ruck, F.S.A.Scot., corroborate the evidence afforded by the discovery of Roman pottery within the area, and lead to the conclusion that the fortress was a Roman redoubt at the junction of two important British roads.

The slight banks and fosses dividing the main body of the camp may be parts of the older British work. The most interesting feature of the camp is the clever adaptation of the sunken British road on the south-east to the requirements of the defence. Elsewhere in its course this road displays the usual characteristics of early trackways, being sunken to a broad, shallow trough ; but here, where it abuts upon the camp, it has been converted into a deep, double-banked, V-shaped fosse, as shown by section G—H.

The other road referred to runs north-west from the point of junction (marked J on plan) in the direction of Cavey Wood and a probable ford over the river Cray.

On the north-west of the earthworks, after a suitable glacis has been left, a steep natural ravine is encountered running north-east towards the tumulus shown on the plan.

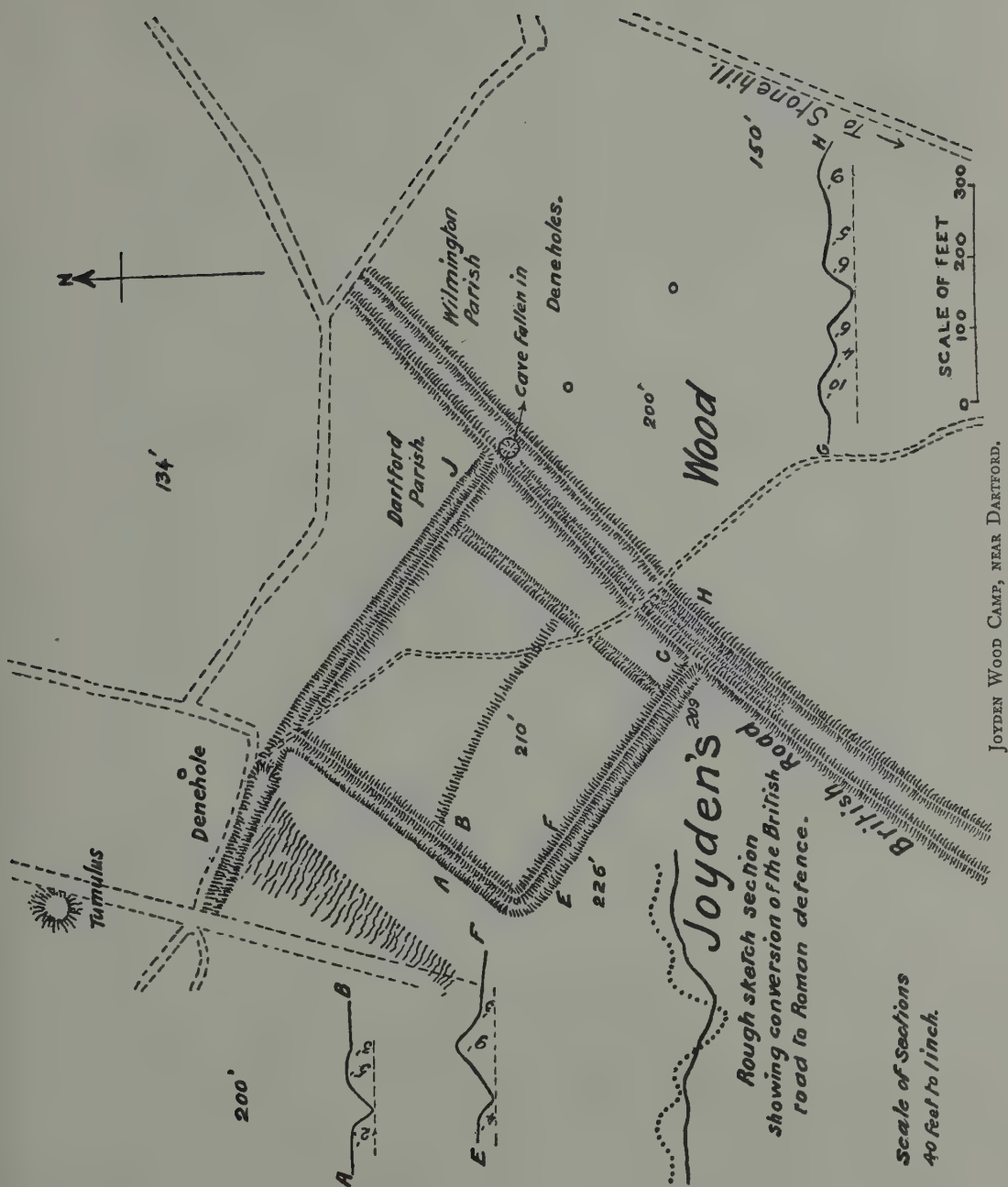
Mr. F. C. J. Spurrell, writing on Dartford antiquities, gives much attention to this early camp and its surroundings, especially referring to the ancient British road.²

Deneholes so abound in the neighbourhood that it is tempting to associate them with the earthworks of the camp, but definite link is missing.

It is certain that there was an earlier settlement on the site, as traces of trenches remain which have been crossed and overlapped by the banks and fosse of the rectangular camp, and the surrounding woodland shows many such early traces which carry the mind back to a far-away Celtic period.

¹ 'Early sites and embankments on the margins of the Thames estuary.' *Arch. Journ.* (1885) xlii.

² *Arch. Cant.* xviii. It is evidence of the antiquity and importance of the 'road' that it became the boundary of the parishes of Dartford and Wilmington.



JOYDEN WOOD CAMP, NEAR DARTFORD.

Scale of Sections
40 Feet to 1 inch.

Rough sketch section
showing conversion of the British
road to Roman defence.

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JOYDEN'S WOOD.—See DARTFORD.

GREENWICH PARK.—Some editions of the Ordnance Survey maps indicate traces of part of an enclosure near the Vanbrugh Park Gate, which must have been more evident a few years since, not only within the park but outside the wall.

The portion indicated outside has been levelled completely, and of that which lies within the park but the faintest traces remain, the banks rising only about 2 ft. above the filled-up fosse. The evidences are vague in the extreme, but excavations may afford some data.¹

LYMNE, or LYMPNE.—The walled Roman camp, known locally as Studfall Castle, situated on a tract of rough ground on the slope below Lympe church, will be described in the section on Romano-British remains.

RECVLVER.—Much-shattered walls surround the eastern and southern sides of Roman *Regulbium*; the sea has destroyed the northern wall, and the hand of man has levelled most of the western section. The remains of this fortress will be found fully described in the article devoted to Romano-British Kent.

RINGWOULD : CAMP.—Hasted mentions that 'in a valley between the two downs or hill-sides near this, there are the remains of an antient camp.'² Presumably this referred to a hollow between the hills towards Kingsdown, where there are still some slight traces of what may possibly have been an outpost camp.

Mr. W. Flinders Petrie described the raised ground south of Ringwould church as artificial but very vague.³ Murray's Handbook states that the ground 'may perhaps mark an intrenchment.' It appears rather to have been the site of some cottages than a military work, according to a local map of 1799.⁴

RIPPLE : CAMP.—On and around the spot now occupied by the rectory, Cæsar is reputed to have thrown up a work on his route from the sea to his principal camp on Barham Downs, but existing evidence is not very tangible.

The land was no doubt naturally suited for an encampment, and it has the appearance of having been artificially improved for the purpose, a short steep hill on one side of Rectory, where a clump of trees now stand, seems as though it may have been in a great measure thrown up for an encampment.⁵

ROCHESTER : TOWN WALL.—This being of Roman origin finds place in another chapter of this History.

SANDWICH : TOWN WALL.—Much of the wall of Sandwich has been converted into a promenade, and destruction has overtaken four out of five of its original fortified gateways. It is hard to say what was the construction of the wall, but probably it was of masonry, afterwards furnished with a bank of earth on either side; nor can we be certain

¹ Under the careful superintendence of Mr. Herbert Jones, F.S.A., the Greenwich Antiquarian Society has conducted exploratory excavation.

² *Hist. Kent* (1799) iv. 177.

³ *Arch. Cant.* (1880) xiii.

⁴ Information from the Rev. H. L. Beardmore.

⁵ *Ibid.*

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to what period to assign it, though our belief is that Sandwich wall is wholly mediaeval.¹

On the northern side of the town the river Stour seems to have been considered a sufficient protection.

A stream protected the wall on the west and on part of the south, and there the rampart is slight; but when we reach the south-east and east, where the salt marshes approach the wall, we find the rampart reared to a height of 17 ft., with a wide, shallow, outer moat.

The sea is now about two miles away, but in early days the tide may have nearly lapped the foot of this great rampart on the north-east.²

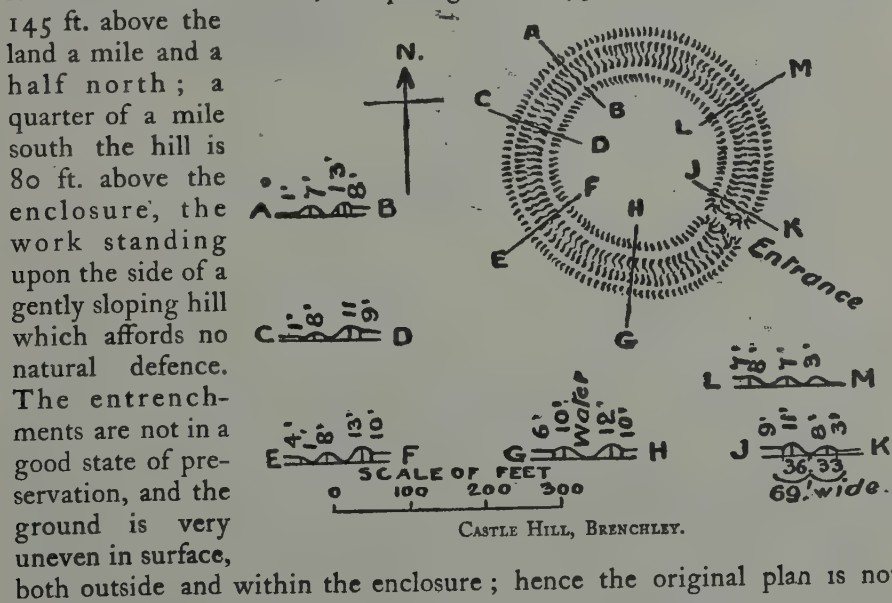
Historical records refer to Sandwich Castle, but not a wrack remains; only its site is indicated, about 250 ft. without the town rampart on the east. When Hasted wrote its foundations remained, and the field containing them was known as Castle Mead.⁴

SIBERTSWOLD, or SHEPHERDSWELL: GOLGOTHA.—In a field are the scanty remains of a rectangular earthwork which is reputed to have been a Danish camp and burying spot. There is, however, no definite evidence of its purpose.

CASTLE MOUNTS

[CLASS D]

BRENCHLEY: CASTLE HILL. This earthwork, situated nine miles south-west of Maidstone, is upon ground 195 ft. above sea-level and



¹ The site may have been occupied in Roman times, as 'remains' have been found, according to Mr. George Payne's schedule in his *Archæological Survey of Kent* in *Arch.* (1889) li.

² Remains of a town wall of masonry exist along this side, but it is of late mediaeval construction, and the barbican gate so late as Tudor times.

³ See Burrows (M.), *Cinque Ports* (1895), and map of the Rutupian Ports in Hasted's *Hist. of Kent*.

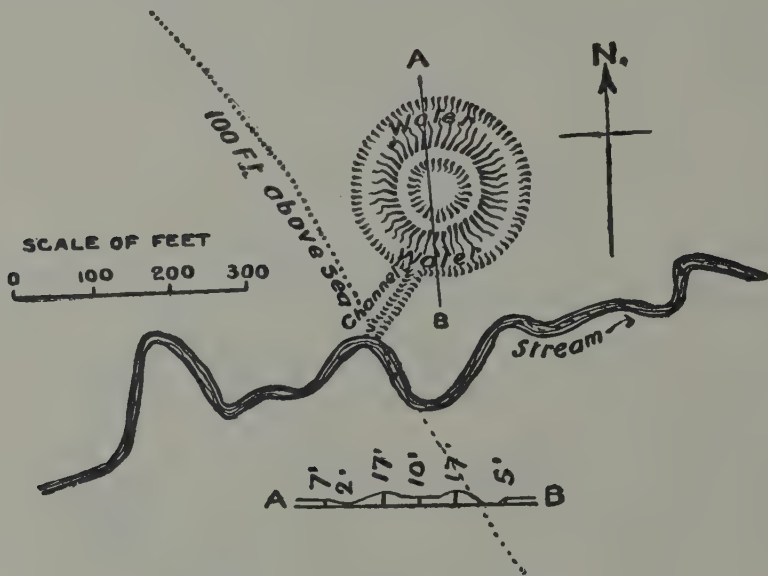
⁴ *Hist. Kent* (1799) iv. 260.

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easily distinguished, but the work appears to have consisted of a deep fosse or moat, with the ballast thrown on both sides to form two ramparts.

The sections E-F and L-M show a second ditch and a third rampart, and about the section G-H the ditch is broader and contains water; the inner rampart about sections A-B and E-F takes the form of 'mounts,' being raised rather higher than other portions of the rampart, but these irregularities are probably not part of the original plan. The only opening is on the south-east, and is presumably the original entrance.

FRITTENDEN: KNOX BRIDGE CASTLE BANK.—This small stronghold, otherwise known as Knocks or Nocks Bridge Castle, stands upon low ground, with the land on the north generally of about the same



KNOX BRIDGE CASTLE BANK, FRITTENDEN.

height for some miles, while the land on the south is considerably higher. The position is slightly defended on the south by the stream, but otherwise has no natural protection. The entrenchments consist of a fosse, with the ballast thrown inward to form a ramparted keep, the fosse containing water of no great depth, once probably much deeper, supplied from the stream by means of a channel now almost filled up. There is no trace of a courtyard or further enclosure, but such might once have existed, protected either by a stone wall or earthwork.

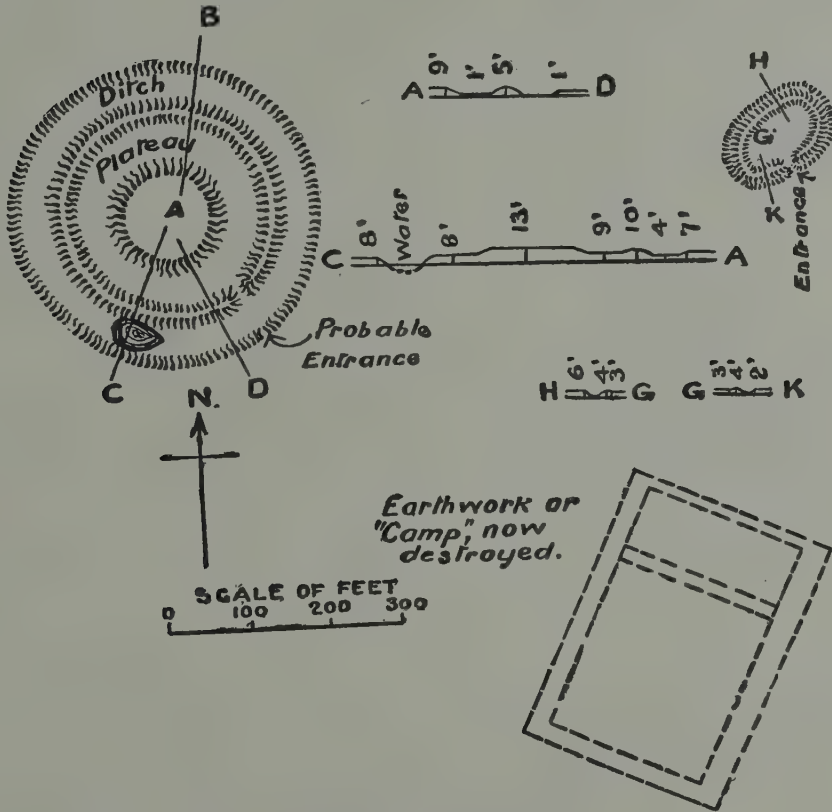
KNOX BRIDGE CASTLE.—See FRITTENDEN.

QUEENBOROUGH.—There was here a group of three works as shown on plan, but of the more important, one (Sheppey Castle) has been terribly mutilated, and the other (the 'camp') appears to have been entirely obliterated. The least important of the three is shown by the

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Ordnance Survey to remain fairly intact, and can be classed as a home-stead moat (Class F).

Sheppey Castle.—From its simple form, it is necessary to include this in Class D, though it is of far later origin than the majority of works thus scheduled. The castle was constructed in the time of Edward III. It lies upon low land, only a few feet above sea-level, within a quarter of a mile east of a reach of the river Medway, the Medway itself and its marshes forming a natural defence on that side, while the land on the east and south was once more or less a morass.



SHEPPEY CASTLE, QUEENBOROUGH.

The entrenchments are much destroyed, hence the original form of the stronghold is more a matter of guesswork than of certainty, but judging from the part remaining, the plan given may be considered as approximately correct; there was a central mount, rather higher than at present, surrounded by a plateau, the two being defended by a rampart and wide moat filled with water. Now an engine-house occupies the mount, a large elementary school with its playground has possession of the west side, the railway goods yard cuts the east, and the north is in danger from a building estate!

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SELLING : PERRY WOOD.—A 'camp' hill is mentioned in Petrie's list,¹ and local tradition recalls it, but now the only earthwork visible in this wood is a circular mount with slight fosse round, very like the work at Wouldham, the mount rising 12 to 15 ft. in height. In old time it may have been a small, defended look-out, as it is in a position suited for the purpose, but in modern days has been converted into what is locally known as the 'Pulpit,' by the erection of a wooden structure on its summit.

SHEPPEY CASTLE.—See **QUEENBOROUGH.**

SWANSCOMBE : SWEYN'S CAMP.²—Antiquaries have told of Swanscombe as the landing-place of Sweyn, King of Denmark, and associated this small fortress with his encampment. Though we know of no evidence to disprove this association, save that no work in England known to be of Danish origin is similar, we would assign its construction to a later period. It is, however, likely that there is some foundation for the tradition that Sweyn landed and wintered his navy at Swanscombe; the valley below the fortress and north-east, protected by the hills, had in those days sufficient water to accommodate the light-draught war vessels of the Danes, whilst the entry in the Domesday Book affords supporting evidence by writing 'Swinescamp' as the name of the place.

Sweyn's Camp is almost circular in form, 60 by 54 ft., defended by a rampart with an outer fosse, the rampart doubtless once much higher than it now is, and the fosse correspondingly deeper.



The spot selected for the construction of the fortress is on a tongue of land about 225 ft. above sea-level, projecting from the hill ground, which extends to the south and south-west for some miles; it commands the north generally, including the river Thames and the south coast of Essex.³

The entrenchments and their immediate neighbourhood being

¹ *Arch. Cant.* (1880) xiii.

² Various known as Sweyn's Camp, Mount or Fort.

³ Trees now obstruct the view northwards.

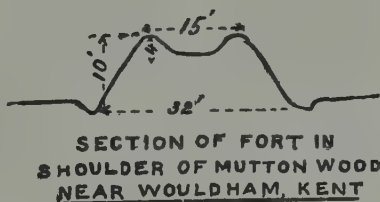
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thickly covered with trees and underwood, it is difficult to make a perfect survey, but the accompanying plan is approximately correct.

WOULDHAM.—In a strip of woodland, sometimes, owing to its shape, called 'Shoulder of Mutton Wood,' on the border of this parish and Rochester,¹ is an isolated mount of unknown date.

Old yew trees grow upon its summit, and it bears the appearance of extreme age, but record is silent as to the period of its construction.

Beyond what is shown by the accompanying section, it is needful only to add that its position is such as to command the eastern approach to an old ford, or ferry, across the Medway, and gives a comprehensive oversight of the surrounding country. We may be tempted to suggest that it was an outpost of the Norman works at Rochester, three miles northward, but cannot so affirm.



CASTLE MOUNTS WITH ATTACHED COURTS

[CLASS E]

ALLINGTON CASTLE.—It is not within our province to describe the picturesque remains of the stone castle, or to recall its historical associations; but around and about the site are traces of the earlier castrametation, which must be mentioned in this chapter.

Long before masons' work was used, there was on this spot a mount and court stronghold, defended by moats and ramparts, having as its leading feature an earthen mount, surmounted by a ring of strong palisading, or stockading, which surrounded a timber-built keep.²

Timber stockading was also carried along the ramparts of the court, or bailey, adjoining the mount, and a moat, abundantly supplied with water from the Medway, probably enclosed the whole of the works. Examination of the surface levels leads to the conclusion that the moat was wider than at present, especially on the eastern side of the bailey, the alterations being accomplished perhaps in Elizabeth's reign, when the place seems to have been remodelled.

Though tradition reports that there was a castle here in Saxon days, and that it was devastated by the Danes, it is probable that we owe the earliest earthworks to Odo, Bishop of Bayeux, to whom the place was granted by William the Conqueror, or to William de Warenne, who obtained it on the fall of Odo.³

There is an interesting entry in the Pipe Rolls of Henry II. (1174-5), *In prosternendo castello de Alintona* 60s., showing that sum to have been expended in throwing down this private stronghold. There

¹ St. Margaret Intra.

² See reference to this class of fortress under Saltwood Castle, *post.*

³ For an old-time antiquary's opinions see Kilburne (R.), *Survey of Kent* (1659).

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can be little doubt that the mount of earth on the south is the poor remnant of the keep-mount, part of the works destroyed on that occasion.

It is probable the site remained waste for many years before the earliest part of the stone castle was erected.

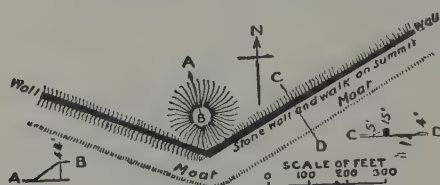
CANTERBURY : The DONJON. The mount, better known under the perverted name of Dane John, is said to be reduced from its original height and peeled all round, but it is still of magnitude sufficient to suggest the possibility of its being the mount of the Conqueror's castle, though it must be remembered that Somner, writing in the seventeenth century, expressed himself thus :—

When first made or cast up it [the complete castle] lay wholly without the city walls, and hath been . . . taken in and walled since ; that side of the trench encompassing the mound now lying without and under the wall fitly meeting with the rest of the city ditch, after either side of the outwork [the court] was cut through to make way for it, at the time of the city's inditching.¹

Hasted² adopted the same view, and is supported by other writers.³ Outside the city wall and moat on the south were sundry hillocks

or banks which have been variously considered—as remains of the donjon bailey, as Celtic tumuli, and as fragments of siege works, but all have been destroyed.⁴

If, as Hasted's plan implies and as we incline to believe, the castle mount was outside the line



THE DONJON, CANTERBURY.

subsequently followed by the mediaeval wall of Canterbury we are forced to ask, What purpose did the Donjon serve ? Perhaps Mr. Harold Sands correctly regards it as a piece of the northern rampart of the bailey destroyed in making the thirteenth-century city wall ; the fragment being augmented in comparatively recent days till it assumed its present altitude of 44 ft. above the adjoining pleasure ground.

The castle and whole city standing on low ground, only about 50 ft. above sea-level, probably depended for protection largely on deep water in the moats, and it is of interest to note that an abundant supply was available from the Stour, which bounded the north-western side of the city.

CHILHAM : CASTLE.—From Hasted⁵ it appears that much of the defensive work was of a character kindred with that of strongholds

¹ Somner (W.), *Antiquities of Canterbury*, p. 144.

² *Hist. of Kent* (1799) iv.

³ Mr. Faussett assigns the mount to Celtic days, regarding it as one of a group of tumuli.—*Arch. Journ.* (1875) xxxii. The full story of the Conqueror's castle has yet to be written ; meantime we advise all interested in the evidences we possess to study Mrs. Armitage's contribution to *The Engl. Hist. Rev.* (1904), entitled, 'Early Norman Castles of England,' which contains, in condensed form, much information relating to Canterbury defences and castles ; see also Mr. Harold Sands's 'Some Kentish Castles,' in *Memorials of Old Kent*, 1907.

⁴ Hasted, *Hist. of Kent* (1799), shows a distinct mount in this position on his plan of Canterbury ; and Speed, *Theatre of Great Brit.* (1611), indicates six mounts which look artificial.

⁵ *Hist. Kent* (1790) iii. 126 and 141.

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under consideration in this chapter; he speaks of its ditch as 'very deep and side almost perpendicular,' and tells us that the 'area within the ditches' is 8 acres, the castle standing on an eminence at the north-west of the enclosure.

So extensive have been the alterations in modern days that there is little tangible evidence of earthwork defences, but from the position of the old keep in relation to the surroundings we may assume that in Norman days the work was such as we include in Class E.

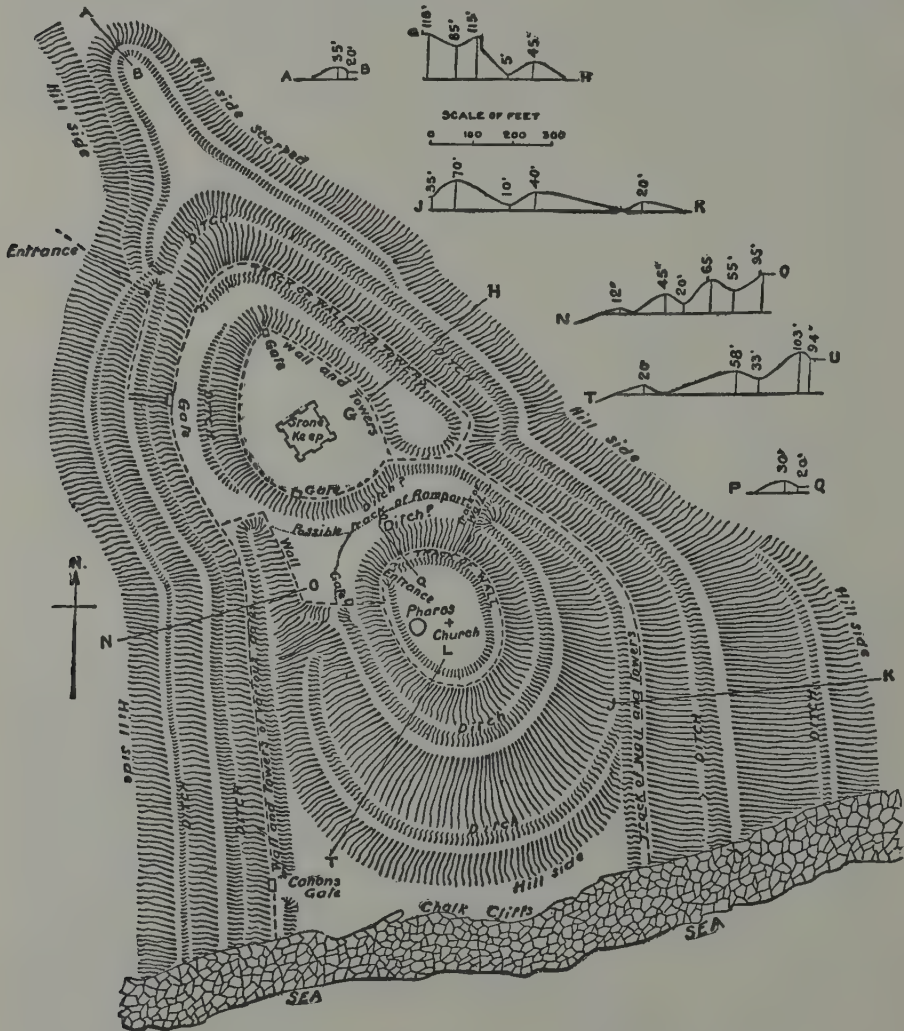
It is believed that a Roman castrum occupied the site, and many relics of the Roman period have been discovered; it is also stated that the Danes sacked a Saxon stronghold here in 838 or 851 A.D., but these matters pertain to other sections of this History.¹

DOVER CASTLE.—This castle was formed out of a natural hill some 300 ft. above the English Channel, which lies at its foot: the high land continues on the north, but at a slightly lower level. The position is naturally defended on the south by the chalk cliffs, which are practically perpendicular for about 200 ft., also by the fall of the hill east and west to a greater or less extent. The accompanying plan is the result of an attempt to show the entrenchments as they existed in Norman times. The entrenchments and masonry are not now in their original condition, great alterations having been made at the beginning of the nineteenth century in expectation of a French invasion, as also earlier and later. By the courteous permission of Colonel Owen, commanding Dover Defences, the writer has made a careful examination of the earthworks as they stand, and with the help of two plans of the castle in the British Museum (King's Room) dated 1737 and 1756, and the Ordnance Survey published in 1819, and his general knowledge of the usual method of construction of such castles, suggests that the work existed upon the lines shown. The shape, proportions and measurements must be regarded as approximate only. The earthworks thus formed: (1) The Mount on the south which occupies the highest portion of the hill, the summit of which was ramparted and strengthened with a wall of masonry; the fall of the hill east, south and west was sharply scarped by the digging of a ditch, and lower down a second ditch was added to the defence; upon this mount stands the ancient tower commonly called the Pharos and the Church. (2) The Bailey, itself rather a platform than the usual horseshoe courtyard, apparently had no rampart, but was defended with a curtain of masonry, and within this curtain stands the stone Keep erected about 1150 A.D.; possibly the masonry took the place of timber. The bailey had its own ditch either complete all round or on most sides. (3) A Middle Ward, either the whole space shown between the two main enclosures, or what is more likely a much smaller space to the west of the section P-Q, the space shown

¹ The site of the stronghold is noteworthy. The prehistoric trackway long known as the Pilgrim Way passes within 50 yds. of the works, and they appear originally to have been sited, not in the best position for defence, but to command the trackway.

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on the plan between the mount and bailey, now (A.D. 1905) occupied by soldiers' quarters, being taken up with the complete ditches to the mount and bailey, a rampart being thus formed between the two. The space shown on the plan on the south immediately above the cliffs is undulating by nature and slopes downward towards the south, south-east and south-west ; it has of late been levelled in places for the erection of



DOVER CASTLE (PLAN OF NORMAN DEFENCES).

buildings, but does not appear to have formed an enclosure in early days. The great central works, apart from their own individual entrenchments, were defended by one deep ditch and inner rampart beginning and ending at the cliffs, and upon this rampart stands a wall of masonry of various dates : upon the north-west the inner bank is wanting, and the original state of the space between the bailey and the

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main entrance is doubtful : the sharp curve in this entrenchment about the middle of the north-east side does not now exist, the ditch being separated by brickwork, but once probably took the line shown on the plan. Beside this great defence the hill-side has been trenched according to the actual needs of the part to be defended ; thus on the extreme south-east the fall of the hill is gentle and an outer ditch has been cut, but too low down the hill to be much protection. The north-east side of the hill has a sharper natural fall and needed no extra ditch. There is on the west an outer ditch, hardly to be traced the last few hundred feet on the south owing to the making of a wide road from the south-west entrance and modern work generally, but it is well marked most of the distance, though there is now a curious perpendicular drop south of the section N-O, probably not part of the original plan ; towards the north it is lost owing to the erection of a bastion, and about the point it probably entered the main ditch the widening of the road here has destroyed the track. The original condition of the extreme north the writer is unable to determine : here the high land continues, and an outwork of some kind would be needed. The outwork now existing and cut by the section A-B has a very modern appearance with its clean and sharp scarp on the outside (sharper than shown in the sections), but this work is shown both on the Ordnance Survey of 1819 and the plan in the British Museum dated 1756, also on the 1737 plan, though wider and less definite, but such a defence in any form lacks the appearance of Norman work. Possibly the outer ditch as found on the west continued round the north in a more powerful form with an artificial rampart, but the original state of this part cannot be truly determined, unless some earlier and more detailed plan exists. As to the entrances, the original approach from the outside was probably that shown on the north-west, and the only approach to the mount was from that side, either by a sloping pathway and gate, or by a bridge across the ditch, if such ditch existed at this point. Of the two gates north and south-west leading into the bailey, that on the north is perhaps the original entrance, or perhaps the only means of approach to the middle ward and mount was through this enclosure. Canons Gate and Colton Gate (near O of the section N-O), though of early make, probably did not exist in the original plan.¹

FOLKESTONE : CASTLE HILL.—On a commanding height overlooking the neighbouring hollows and dominating the country seaward are the extensive earthworks generally known as Cæsar's Camp.

Explorations led the late General Pitt-Rivers to conclude that the work was of a period far later than its popular name suggests, attributing the whole to the Normans. There is certainly nothing of Roman character about the castrametation, and works having a citadel at one end are found elsewhere to be of the Norman period. At first sight, and noting its position, one would incline to look to pre-Roman

¹ This description and plan of Dover Castle is contributed by the Rev. E. A. Downman.

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days for the construction of this strong hill-fort ; indeed the discovery of British pottery would seem to support this opinion, but General Pitt-Rivers' careful examination leaves little room to doubt the approximate date, and the presence of British relics can possibly be attributed to the previous presence here of a burial tumulus destroyed maybe in digging the castle works.¹

The entrenchments form three enclosures : (1) That on the south-west occupying the highest portion of the hill and acting as the keep of the castle. The inner fall of the rampart of this keep is hardly traceable in places, and about the section E-F the most perfect part is now only about 4 ft. in height. (2) That on the east acting as the bailey, or court, but of very uneven surface, the central portion running roughly east and west as a natural ridge. (3) A small sloping space on the north-west approached from the court-yard by the outer rampart of the keep, and down the gully north of the keep.

Within and below the inner rampart cut by the section G-H are depressions in the ground, and the ditch is divided by low causeways at certain distances, such as are found at Winkelbury in Wiltshire and elsewhere.

General Pitt-Rivers' description is so precise that we cannot do better than quote some portions of his minute account of the results of the explorations conducted under his personal supervision in 1878² :—

It [the fortress] is on the apex of a cape and is guarded by a 'bay' or 'coombe.' Whether it was that the sides of this bay were not originally sufficiently steep to form a natural defence, or that an attack on this quarter might be more probably expected, the sides of the bay on the west side of the Camp, immediately outside the ditch of the citadel, have been artificially escarped for a depth of about 90 ft. so as to give the slope an angle of $41\frac{1}{2}^{\circ}$ with the horizon.

On the south side of the Camp the natural escarpment is at an angle of 30° and the height 250 ft., whilst on the north side the slope is not more than 15° , and the total height from the summit to the bottom of the valley on that side about 80 ft. This being the weakest side is therefore defended by two ramparts, viz., that of the outer camp (the outer rampart) and that of the citadel (the inner or upper rampart), whilst the stronger sides are defended by part of the citadel only.

Respecting the traverse, which runs from the inner to the outer rampart on the north of the citadel, we read :—

Such a traverse might either have been constructed to cut off a breach during an attack on the west side, or if an attack on that side was anticipated it might have formed part of the original defence. The fact that the ditch of the traverse does not run into that of the citadel, but leaves a causeway about 15 ft. in width, to facilitate communication between the two outer compartments of the Camp, favours the opinion that it formed part of the original defences.

Immediately to the north of the outer rampart is a level space of about 700 ft. by 450 ft., which is bounded by the bank running along the counterscarp of the northern fosse of the camp on one side, and on the east by its continuation in a northern direction, parallel with the

¹ The General noticed such a tumulus on the western side of the ravine on the west of this fortress.

² *Archæologia* (1883), xlvii.

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eastern ravine but about 50 ft. from the edge, allowing room for the road of approach to the whole of the stronghold.

From this bank another bank or rampart with a ditch on the south side runs along the edge of the natural chalk escarpment in a good defensive position, commanding the slopes and following the sinuosities of the ground, rounding Sugar-loaf Hill and extending perhaps originally as far as the chalk cliffs on the sea coast, a distance of about two miles.

Although the relics found during the excavations (with the exceptions already mentioned) pertain to about the Norman period or later, some on the natural surface on which the ramparts were reared, it is not possible to fix the precise date of this fortress. It may have been

made in the time of Edward the Confessor, or may date from later days, even to the time of Stephen, one of whose coins was found.

When we read that the original base of a fosse was found over 8 ft. below its present level, we can form some idea of the extent of denudation of the ramparts and consequent filling up of the ditches which have taken place during long centuries of exposure to wind and weather, and perhaps picture the great strength of this fortress when constructed, bearing in mind that, in addition to deep fosses and huge ramparts, palisades of sturdy timber aided its defence against the foe.

LEYBOURNE CASTLE.

—The castle is situated on land about 80 ft. above sea-level. The position has no natural defence except on the east-south-east, where the hill has been scarped. The en-



LEYBOURNE CASTLE.

trenchments are not in a perfect state of preservation, and probably belong to a work earlier than the present ruinous masonry. They appear to

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have consisted of a rampart and ditch, enclosing a space roughly circular, the scarp referred to taking the place of other defences on that side. The ditches and scarps to the south of the mount are possibly not part of the original plan, or may indicate the presence of such a base court as we should expect to find attached to the mount. The original entrance appears to have been from the south.

ROCHESTER : BOLEY HILL AND CASTLE WORKS.—The limitations placed on the scope of this article forbid us to discuss at length the disputed question of the date of the construction of the earthworks on Boley Hill ; suffice it to say that the writer holds the long-accepted theory of Danish origin¹ to be untenable, and thinks that the southern fosse may have guarded a Celtic settlement on the promontory, though, on the whole, inclined to attribute the entire work to Norman hands.

Boley Hill occupies a position close to the northern termination of a boldly projecting ridge of land, the adjoining castle works being on the extreme point, all protected on the west by the waters of the Medway and at other points by artificial earthworks.

G. T. Clark says these works are on a large scale, and adds :—

they seem to have been composed of an oblong space included within a ditch, which commenced near the bridge foot, and was carried eastwards for about 130 yds., when it turned to the south, and ran for about 270 yds. roughly parallel to the river, towards which it was again returned. This oblong area was sub-divided into two original parts, the southern being the smaller, by a cross ditch, and the latter part was occupied by a large flat-topped conical mound, known as Boley Hill. The northern part contains the castle. Along the east or cathedral side this ditch is in part a bold natural depression. Along the west side it is superseded by the river, here very broad, deep and rapid. The area thus included is about $7\frac{1}{2}$ acres.²

From the great depth and width of the southern fosse or ditch it is plain that an enormous mass of chalk and earth must have been removed. Much of it was piled to form the rampart which is so conspicuous in the garden behind Satis House and the adjoining buildings, but probably more was thrown on to the surface of the enclosure to raise Boley Hill into the mount-like form it still retains, notwithstanding the havoc made by roads, buildings, and other agencies.

The great southern fosse ends abruptly on the west, where it met the waters of the Medway, but on the east it was turned northward and continued north and again west till it joined the protecting tidal waters.

At about 350 ft. northward from the great fosse, where the land slopes abruptly, we meet the second fosse, now guarding the southern side of Rochester castle and its bailey.

In the construction of the latter fosse a portion of the Roman town wall seems to have been destroyed.

Like its southern counterpart, this fosse ended at the water-edge on the west, and on the western side of the castle enclosure the Medway

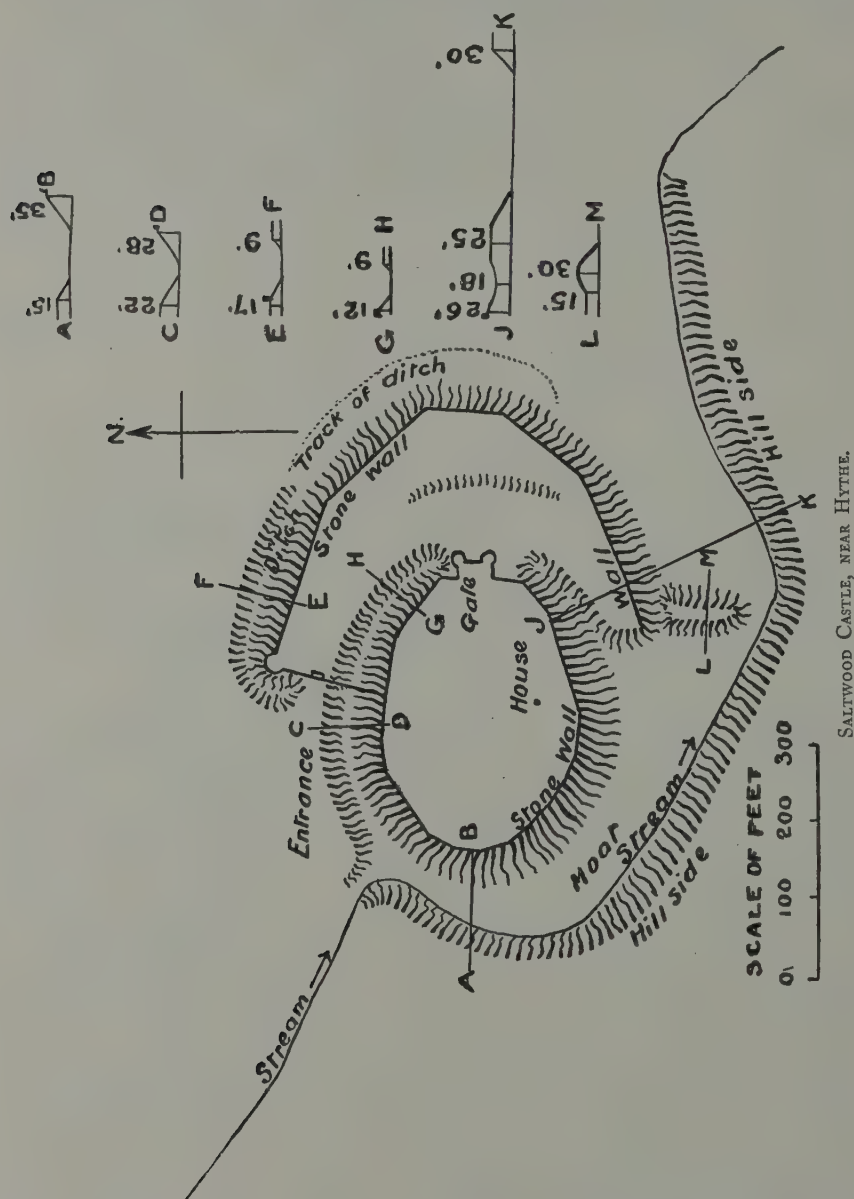
¹ Hasted, in his *Hist. Kent*, iv. 161, says : ' Bully Hill . . . was thrown up by the Danes in the year 885, at the time they besieged this city.'

² *Mediæval Military Architecture* (1884), ii. 406.

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rendered a fosse unnecessary. It remains, as already mentioned, conspicuous by its depth on the east of the castle and partly on the north.¹

SALTWOOD CASTLE.—The massive masonry of the castle, and the picturesque appearance of the surroundings, render this a well-known



object of interest to visitors to Folkestone, which lies about four miles eastward. Our concern, however, is not with the castle building erected

¹ Two important papers relating to early defensive work at Rochester have appeared in *Arch. Cant.* 'Boley Hill,' by G. L. Gomme, F.S.A. (vol. xvi.), and 'Roman Rochester,' by George Payne, F.S.A. (vol. xxi.).

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by Archbishop Courtenay in the reign of Richard II, or with later alterations, but to show how skilfully the defence was made by earthen banks and fosse.

We may safely assume that the castle of masonry was not erected till many years after the artificial portion of the mount was thrown up. Doubtless a timber structure, such as those depicted on the Bayeux stitchwork, was the first occupant of the mount, which could not then support the weight of stone. Such timber castles, encircled by strong stockades or palisades of wood, placed on high mounts of earth and surrounded by deep moats or fosses, were quickly constructed and rapidly attained formidable power of resistance.

That the earthen mount here was originally higher and of the typical form of such *mottes*, steep, conical and flat-topped, there can be little doubt from an item in the Pipe Rolls, under date 1174-5, of 20s. for the cost of throwing it down.¹

The site is 170 ft. above sea-level, with much higher land half a mile north; the English Channel lies a mile south, the coast being approached from the heights by a narrow combe down which runs a small stream. An arm of this stream flowing past the castle was so treated as to afford additional defence to the works; its valley, a natural protection on the west and south, was artificially scarped and widened, a dam being thrown across on the eastern side, thus providing a wide moat effectually filled with water. This piece of engineering will be understood on examination of the plan (see dam L-M). The mount or keep, oblong in form and now furnished with a high wall of masonry, stands some 35 ft. above the moat on the west and south, where the ground is more or less of natural formation, the other portion being raised by ballast thrown up from the fosse on the east and north.

To the east of the mount is a court or bailey, which originally depended for protection partly on the steep slope south-eastward, a deep fosse guarding the more northern portion (see E-F). Where the curtain wall of stone runs along the top of the bailey rampart was probably once a stockade of timber, similar to that which then encircled the summit of the mount, but it is possible that, so much of this being natural ground instead of thrown-up earth, masonry of a sort may from the first have guarded the bailey, as appears to have been the case at Thornham and Binbury castles in this county.

STOCKBURY.—This earthwork appears to be the remnant of a mount and court castle of somewhat unusual form; it stands upon ground about 350 ft. above sea-level, and 130 ft. above the land to the east. The position is but slightly defended by the nature of the ground, as the fall of the hill is of no great steepness. The entrenchments formed two enclosures: (1) A circular mount or keep on the north-west (much destroyed by a modern house and farm buildings), which may have been a high mount, now levelled, but judging from the faint trace of banking (section G-H) it appears rather to have been a ramparted enclosure.

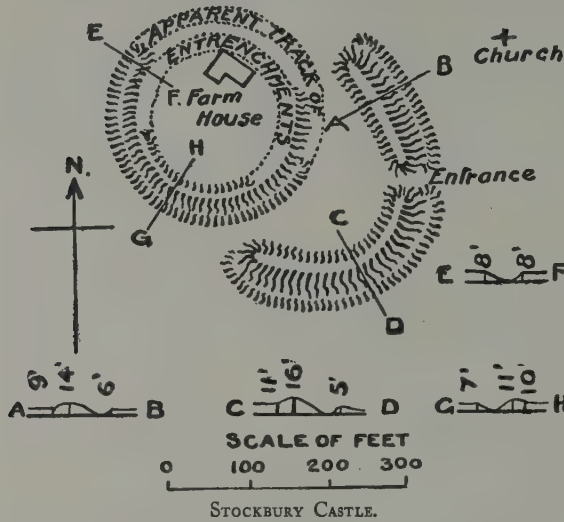
¹ 'In custamento prosternendi Castelli de Saltwdar 20s.'

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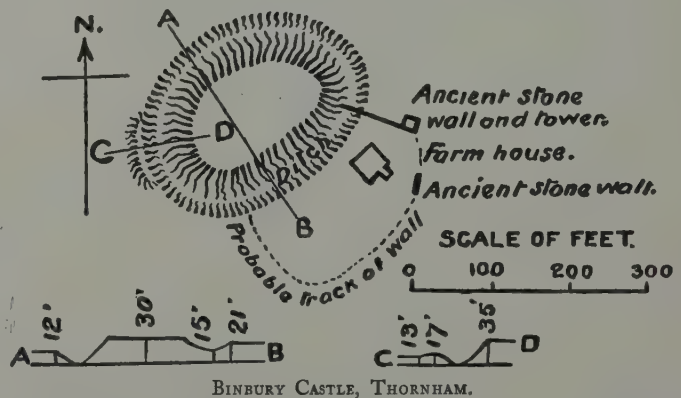
(2) A court-yard or bailey, the rampart and ditch of which is more or less perfect. The ditches of the two enclosures may have once run into one another, but there is no sign of the junction.

Watling Street runs two miles distant on the north, the Pilgrim Way three and a half miles south.

THORNHAM (or THURNHAM): BINBURY CASTLE. — This work, situated about four miles north-east of Maidstone, consists of a mound or raised enclosure, deeply fossed, and a court-yard, standing about 520 ft. above sea-level, with slightly higher land on the south-east, and some-



what lower on the north-west. The position is without natural defence, being tableland of the North Downs. The artificial oval-shaped mount is 35 ft. above the lowest part of the ditch which surrounds it, and the summit forms a practically level platform. Upon the west a slight outer rampart, or scarp, appears to have formed part of the original plan, and may have extended much further round. A court-yard protected by a stone wall existed on the south-east; portions of the wall still remain, 2½ ft. thick, also a small tower, but there is no trace of the rampart and ditch usually found with strongholds of the mount and court type. It will be noticed that Thornham, or Goddard's Castle, also consisted of a mount and court-yard, the latter protected by a stone wall instead of a rampart and ditch; hence these two places show a form of defence which may be a link between strongholds of the mount and court type (E) and those having now a mount only (Class D), for the stone



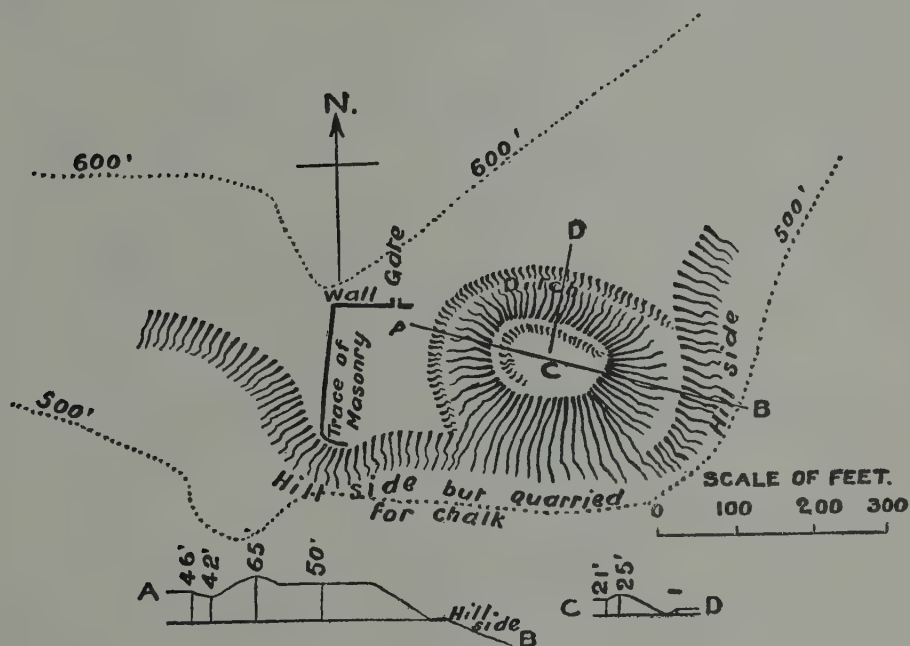
walls which protected the courts of the latter, if they ever existed, would rapidly be carried away when the castles were destroyed. It is hard to

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remove every trace of a strong earthen rampart and fosse, but stones are easily removed and leave not a trace.

The destruction of the wall of the court makes the position of the original entrance a matter of speculation. The mount stands within the private grounds of the farmhouse, which occupies part of the court of the ancient stronghold.

THORNHAM (or THURNHAM): GODDARD'S, or THORNHAM CASTLE.—Within a mile and a half of Binbury castle stand the remains of this somewhat similarly planned stronghold, consisting of a mount and court, constructed upon and formed out of a natural spur jutting southward from the range of hills running east and west. The position is naturally



THORNHAM CASTLE.

defended on the east and south by the slopes of the hill, but the south and east sides are not now in their original state, the ground below the castle having been quarried, while on the west a roadway has been deeply cut. The entrenchments consist of a mount, more or less natural, having a fosse upon the north and west now nearly filled up, the summit of the mound being provided with a rampart on the weaker sides. A stone wall $4\frac{1}{2}$ ft. thick, of which there is but little left, guarded a bailey or court upon the west; this wall probably continued up the side of the mount and possibly joined one encircling the summit.¹ The stone-work of the wall is of some height upon the north of the bailey, and foundations of it are visible upon the west and south-west.

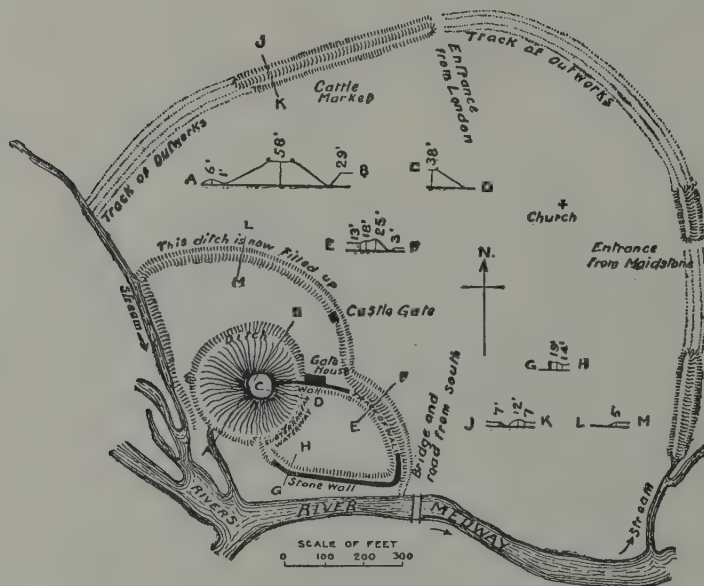
¹ The surface of the summit is now very rough and unequal in level,

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When Hasted wrote¹ much more of the bailey walls were in evidence, though 'honeycombed and almost eaten up by the weather and length of time . . . they are about 14 ft. high and near 3 broad.' Traces of walling remained round the keep mount, and large fragments had been tumbled into the chalk quarry on the southern side.

The castle commands one of the most extensive views in Kent, overlooking the Pilgrim Way at a short distance below and the wide stretch of the Weald.

TONBRIDGE: CASTLE AND TOWN WALL.—The castle is upon a spur or bank of gravel projecting southward from higher ground, scarped and re-formed in creating this typical mount and court stronghold. It stands amidst the lowlands of the Medway and its tributary streams, which, with the marshes, defended the position on the south and west.



CASTLE AND TOWN WALL, TONBRIDGE.

Fortunately the most striking feature remains fairly intact, for the mighty mount, standing nearly 60 ft. above its moat and commanding the surrounding country, has been altered only by cutting footpaths for access to the summit; but its moat has, on the side next the base-court on the south-east, been furnished with a culvert and levelled, whilst it has in some other portions been partially filled with earth.

The first castle to crown the mount was doubtless of timber, forming such a defensive work as we have had to notice elsewhere (see Saltwood, etc.), but owing to the character of the ground it was possible to build with stone at an early period, and we find the remains of a shell keep of masonry on the summit. A culvert may have been constructed in the position above mentioned when the stone castle was

¹ *Hist. of Kent* (1782), ii.

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erected, but probably the open moat completely surrounded the original work.

The partial destruction of the moating in other portions of its circuit may to some extent be due to natural silting, but mainly to artificial filling with earth in modern times to prevent the flow of water from a stream which contributed largely to the original defences.

The stream, a tributary of the Medway, which it joins under the castle walls, was tapped on the north-west of the work to flow round the courts, and to supply the moat of the high mount with water.

On the south-east of the mount is the base-court or bailey, second in importance to the keep mount, which is protected on the south by a high wall of stone¹ with an inner bank of earth, and has on the east and north a fosse or moat with an inner rampart of earth, on the summit of which stood a stone wall connected with that on the south, but here probably, as on the mount, the first defences were of timber. The moat of this court was carried in a wide sweep to the north-west, thus forming a second court as shown on the plan; though now much destroyed the course of the moat is evident, but its rampart of earth or stone has almost disappeared, excepting at the castle gate. The western side of this second court was protected by the stream. The land at A on plan would be under water in early days, and it is not unlikely that a water-gate existed where the banking of the stream so nearly touches the counter-scarp of the moat appertaining to the mount.

The castle and its precincts being in possession of the urban authorities are well known to visitors, but few are aware that portions of outworks, forming the ancient town-wall, exist, and that the course can be traced throughout (see plan).

These works on the north and east, combining with water defence on the south and west, form a roughly semicircular enclosure sufficiently similar to some promontory camps to raise the question whether it also is not the work of pre-Roman Britons, but having no knowledge of discoveries to prove this, we must assume the town ramparts to be co-eval with the castle works, and trust that care will be taken to preserve the fragments which remain.

It seems likely that some of the water of the western stream which fed the castle moats may have been diverted to fill a part, at least, of the moat outside the town rampart.

LIST OF HOMESTEAD MOATS

[CLASS F]

ASH (by SANDWICH) : CHEQUERS COURT.—Moat with an extension of western side south of main work, probably originally a double island moat, may be traced.

BENENDEN : MANOR HOUSE.—Nearly three-quarters of the old moat still exist.

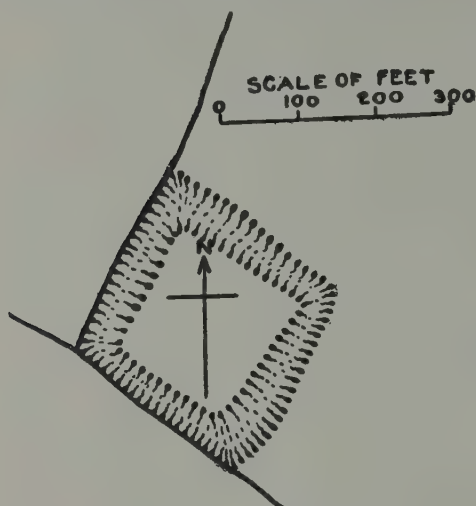
BILSINGTON : COURT LODGE.—To the west of the church this very complete moat remains.

BILSINGTON : PRIORY.—The site of the Priory of Augustine canons (founded 1253) retains portions of its moating—and another partly moated enclosure adjoins.

¹ Now, alas! this mediæval wall is hidden by rampant ivy, and being further destroyed by roots of trees growing above.

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BOUGHTON ALUPH : WILMINGTON MANOR.—About a mile and a half south of the parish church is this typical example of a simple homestead moat, of which a plan is given.



WILMINGTON MANOR MOAT, BOUGHTON ALUPH.

In works of this class the earth dug to form the moat, or fosse, was thrown inwards and spread, thus raising the enclosed space above the level of the surrounding land and securing a dry, well-drained site. Access was originally afforded by a drawbridge or removable platform.

BRENCHLEY : MOATLANDS.—Nearly the whole of the moat of a castellated early sixteenth century mansion remains.

BROMLEY : PALACE.—The site of the old palace of the Bishops of Rochester retains part of the moat, the line of which may be traced throughout.

BROMLEY : SIMPSON'S MOAT.—Very little remains to suggest that a formidable moat was here, surrounding a castellated hall of the fourteenth century. The *Archæological Journal* (vol. xxv.), 1868, shows that far more existed at the date of that issue.

CAPEL : BADSELL.—Three sides of the moat remain in good condition.

CAPEL : MOAT FARM.—About a mile north-east of Capel Church are traces of moating.

CHEVENING, CHIPSTEAD : MOAT FARM.—This small, nearly complete homestead moat lies about a mile north-east of Sundridge.

CHISLEHURST : SCADBURY.—Writing so long

ago as 1778, Hasted says that the 'antient mansion of Scadbury has been many years in ruins,' and that its material had been used in a farmhouse building. From the plan of the existing moating it is evident that the work was originally of the double-island form, and that much care had been exercised to defend the enclosure.

COWDEN : THE MOAT.—About a mile north-east of the village is a moated enclosure, one side of which was formed by a stream, a feeder of the Medway.

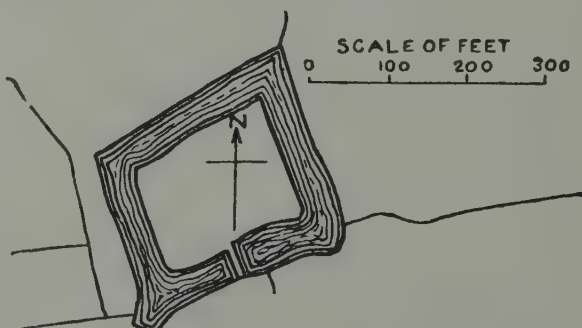
Though less than 200 ft. square, this was a place of considerable strength.

CRANBROOK : GLASSENBURY.—It is probable that the moat, which remains in part around the restored mansion of Glassenbury, was made when Walter Roberts, who possessed the estate in the reigns of Edward IV. and Henry VII., pulled down the older seat on the adjoining hill and built another on the present site, which Hasted says he moated round.¹

CRANBROOK : SISSINGHURST CASTLE.—The buildings and ruins which remain, being part of the stately mansion built in the 16th century, will be referred to in a later section of this History; here it is only necessary to note that a considerable length of moating remains.

It is probable that this may appertain to an earlier time than the date of the mansion, though there is hardly sufficient visible evidence to show that moating was carried round the whole enclosure at any period.

The Ordnance Survey map shows that the north-east angle of the moat is perfect, and that thence the northern arm extends for 250 ft. and the eastern for 320 ft.



BROXHAM MOAT, EDENBRIDGE.

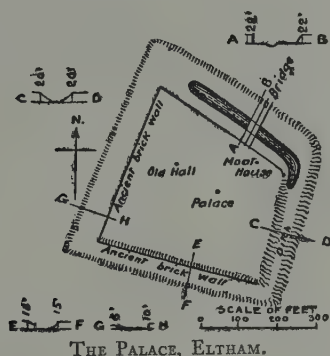
CRAYFORD : HOWBURY.—Within a short distance of the river Darent and close on the Thames marshes much moating still encloses

¹ *Hist. Kent* (1790), iii. 45.

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the farm buildings. From its position and surroundings we judge this to be the site of an early settlement, perhaps Saxon or Danish.

EAST WICKHAM.—MOAT HOUSE. Part of the moat only exists.



EDENBRIDGE: BROXHAM.—Here is a fine example of a homestead moat in perfect condition, rectangular in shape and well filled with water from a streamlet. Its size is about 270 by 230 ft., the moat being nearly 50 ft. wide. It is just such a strong place as we imagine was necessary in the days when clearings for settlement were made in the forest district.

EDENBRIDGE: DEVIL'S DEN.—About three-quarters of a mile south-east of the church is this smaller but complete moated enclosure.

ELTHAM: THE PALACE.—In this chapter we have not to notice ancient structures remaining, but confine our attention to the earthwork defence. In type it is that of a homestead moat, though of larger size than is usually attained by such simple works.

Here we find the enclosure surrounded by a wide moat, so made as to form a water-level, the west-north-west side being the base, and as will be seen by the sections, the water, if level with the outside on the west, must have been much below the land outside and inside north-east and east, but at the south-west corner an underground passage leading into the moat shows that the water level could not have been much above the present bed of the moat. Now three sides are dry, those south and west being under cultivation as a garden. A brick wall of ancient date can be traced and may once have existed on all sides, but the depth of the moat on the east and west rendered such a defence unnecessary. Outside the moat on the south-west the ground is uneven of surface, as if some further defence might once have existed.

ELTHAM: WELL HALL.—A deep water moat encloses a rectangular island about 125

by 110 ft. in area, adjoining the southern wing of the Elizabethan house, once the home of Margaret Roper, the daughter of Sir Thomas More. The western arm of the moat extends northward, and may at one time have continued around Well Hall itself.

FOLKESTONE: PARK FARM.—To the south-east of the farm premises, on one of the foothills of the great chalk range, are slight but complicated traces of considerable moating.

GOODNESTONE: CRIXHALL FARM.—Here is a fairly perfect but small homestead moat.

GREAT CHART: THE MOAT.—A small but nearly complete example close to the high road half a mile south-west of the church.

GREAT CHART: SINGLETON.—About half a mile east of the high road, another good homestead moat.

GROOMBRIDGE PLACE.—See SPELDURST.

HARTY: SAYE'S COURT.—The nearly circular moat here is probably of early date; the east and south of the islet of Harty (included as part of Sheppey) lies exposed to the Swale, once the waterway of numerous foes, when anything worth preserving must have needed strong protection.

HAWKHURST: CONGHURST.—A little more than half the moating is left, enclosing the site of the ancient hall.

HERNE: HAWE FARM.—The site of a manor house is surrounded by a moat perfect in parts and traceable throughout.



MOAT AT SHARE FARM, HORSMONDEN.

HORSMONDEN: SHARE FARM.—It is not often we see so fine an example of a water-girt defensive enclosure. As the plan indicates, one branch of the river Teise was dammed,

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causing the water to flow into the moats, and it seems as if the action of the dam could be so regulated as, in case of need, to flood the ground between the two branches of the stream excepting the central island, which would thus be secured against all foes.

Horsmonden was a clearing in the dense forest of Andred, probably dating from later Saxon days than the settlements on the hills and open lands. Possibly this moated enclosure may be of that period. Simple homestead enclosures, guarded by a single fosse or moat, may often have been intended mainly for protection from wolves and other wild beasts, but so complex an arrangement as this example shows indicates defence against human enemies—maybe against Danish marauders.

IGHTHAM: THE MOAT.—This well-known castle-mansion, one of the most picturesque in England, will be described in another chapter; here it is sufficient to note that the waters of a small feeder of the Medway are held back by a substantial dam, flooding the wide moat which surrounds the ancient buildings.

IWADE: MOAT FARM.—Situated near the waters of a creek of the Medway, on the border of the marshlands, the position probably needed defence in early days, and considerable moating is in evidence.

KINGSNORTH: MANOR HOUSE.—A complete moat remains around the site of the old manor house about half a mile north-east of the church.

LEIGH: GREAT BARNETTS.—Fairly perfect moat remains, about half a mile east of Leigh church.

MARDEN: MOAT FARM.—Only part of the original enclosure is now moated.

MERSHAM: QUARRINGTON.—Here is a nearly complete example of homestead moating in the north of Mersham parish.

MILTON (near SITTINGBOURNE): GREAT NORWOOD.—Stephen, son of Jordan de Shepey, obtained a grant of the manor of Northwood, otherwise Norwood, and built a mansion here in the time of Richard I or John. It may be that to him we owe the extensive moating, much of which remains around the farmhouse and buildings. The place must have been of considerable importance, as Stephen assumed the name De Norwood, which all his descendants continued to use.¹

NEWENDEN: LOSENHAM.—Part of a moat appears to remain on the west side of the site of the Carmelite Priory.

PLUCKLEY: PEVINGTON.—An oblong moated

enclosure remains, about three-quarters of a mile north-west of the parish church.

QUEENBOROUGH.—The homestead moat, situated about 500 ft. east of Sheppey Castle, is shown on the plan of that work (Class D).

ROLVENDEN: LOWDEN MANOR, also called Little Maytham, is mentioned by Hasted, no house remaining, 'but the scite of the antient mansion, and the moat around it, are still visible.'²

SEVINGTON: BOYS HALL is in the parish of Willesborough, but the site of the old hall which preceded it is just over the border, in Sevington. Here, according to Hasted, the spot formerly occupied is known as The Moat.³

SHIPBORNE.—There are remains of a moated enclosure in the lower part of the Park.

SPELDHURST: GROOMBRIDGE PLACE.—The description of this place of picturesque surroundings must be left to another chapter; here it is sufficient to draw attention to the practically perfect moat, broad and deep, surrounding the buildings.

STAPLEHURST: BRATTLE.—This enclosure, with its protecting moat much mutilated, lies about a mile south-west from the church.

SUTTON VALENCE: MOATENDEN.—On the west of the road to Tenterden are considerable remains of a moated enclosure.

THANINGTON: TUNIFORD.—The ancient mansion which stood here was well defended by a moat of which some portion remains, together with a gateway arch, and other masonry incorporated with the present house.

WESTWELL: YEWTREE HOUSE.—Here are fragmentary remains of a moat on the east side of the railway.

WITTERSHAM: PALSTRE COURT.—Much mutilated remnant of the moat exists round the enclosure.

WOODNESBOROUGH: GROVE MANOR.—The moating here remains in parts of its course.

WOODNESBOROUGH: POLTON MANOR.—Originally Poltmans, from the name of the family residing there, their mansion being castellated and surrounded with a moat.⁴ The house was rebuilt in 1629, the moat being retained.

WROTHAM: MOAT FARM.—Little traces remain of the once considerable moating round the enclosure, which is about a mile south-east of the church.

YALDING: CHEVENEY.—Here are the nearly complete remains of a small homestead moat, about a mile north-west of Hunton Court Lodge.

¹ Hasted, *Hist. of Kent* (1782), ii.

² *Hist. Kent* (1790) iii. 89. ³ *Ibid.* 277.

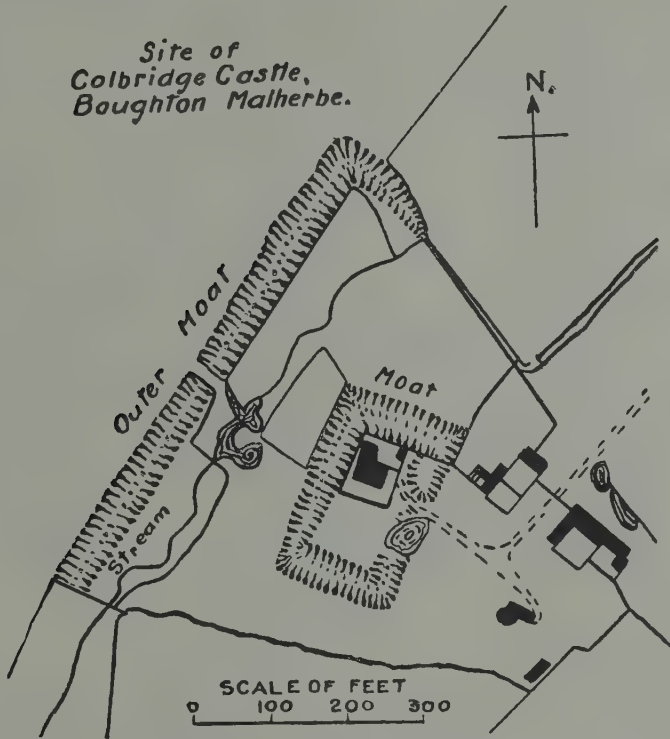
⁴ Hasted, *Hist. Kent* (1799), iv. 238.

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MOATED ENCLOSURES WITH STRONGER DEFENSIVE WORKS

[CLASS G]

BOUGHTON MALHERBE: COLBRIDGE CASTLE.—At Coldbridge, or Colbridge, Farm,¹ about three miles south of Lenham, are the extensive moats which mark the site of the early castle of the Peyforers. Here, as in many Kentish examples, water was made to play a principal part in the scheme of defence. The site is on the slope of the land towards



MOAT AT COLBRIDGE FARM, BOUGHTON MALHERBE (ON SITE OF CASTLE).

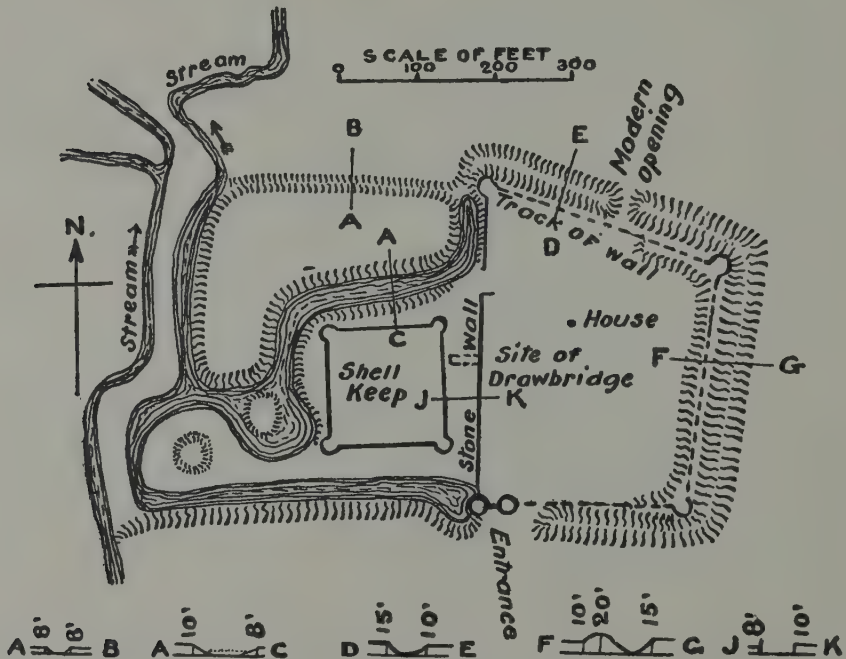
the south-east, and a stream was dammed and partially diverted to fill the moats with water. Though it is not apparent that the outer moat extended sufficiently to form a second defence on all sides, there are indefinite traces of its further continuation here and there. The inner moat which protected the keep is well defined.

COOLING CASTLE.—This is a stronghold of a class to which belong Brandon in Warwickshire, Old Ingarsby in Leicestershire, Braybrooke in Northamptonshire, and others. It stands low, less than half a mile from the marsh land of the Thames, and within two miles of the river, possessing no natural defence other than water may have provided. The defences of the castle consisted chiefly of stone walls and water moats,

¹ The ancient name seems to have been *Colewebregges*. A licence to crenellate was granted 7 Edward II.

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but the extreme east was fortified with a rampart and outside ditch of some strength. Several enclosures are formed: (1) A Shell Keep of masonry, nearly square, defended by a moat. (2) A large Court Yard on the east, apparently defended by a stone wall with corner towers and outside ditch; probably once containing water. (3) A Court on the north-west defended by water only. (4) Two small spaces on the south-west, one an island, the other a platform surrounded by a ditch, neither raised artificially above the natural level. The water is supplied by springs, and perhaps at times the sea washed round the moats.



COOLING CASTLE (SHOWING MOATS).

EYNESFORD CASTLE.—The ruins of this once important Norman castle will be the subject of remarks in another section of this History. It is sufficient here to note that its sole earthwork defence—the moat—may still be traced, its wide expanse utilized as an orchard and meadow. The artificial cut by which it was flooded from the Darent remains.

HEVER CASTLE.—As this beautiful example of an English castellated mansion will be fully described in another section of this History, we have but to note here that double moats added to the defences. These, though in parts maintained afterwards, probably appertained to the earlier castle, which occupied the site of the present building. A castle was rebuilt here in the time of Edward III, and a stronghold may have existed from Saxon days.

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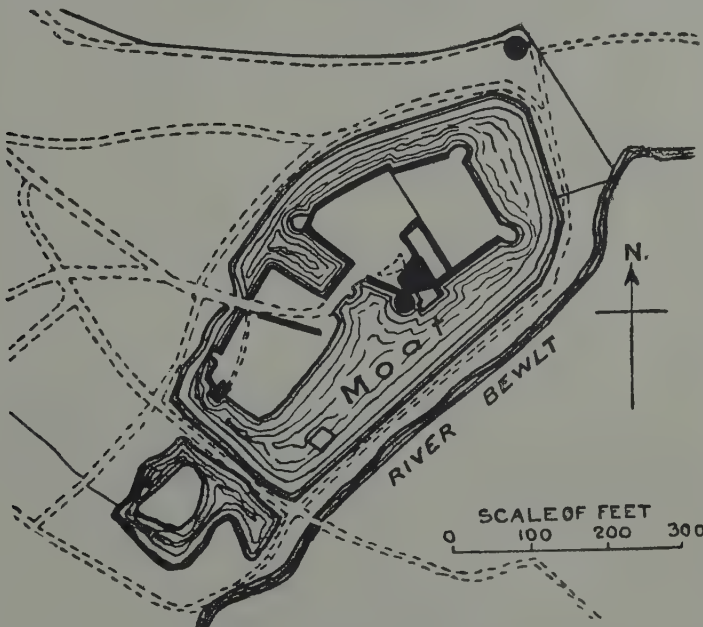
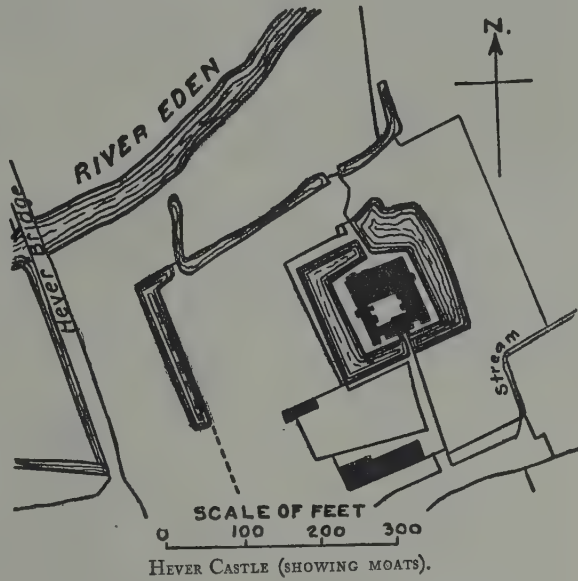
The moats, fed from the river Eden and a small stream on the east, must have afforded strong protection when the outer moat was complete.

As the plan shows, this is now much destroyed, but it is easy to trace the line it followed before being levelled.

IGHTHAM: THE COURT.—In the piece of woodland known as the Wilderness, on the north of the manor house, are remains of earthworks.

The southern is a circular work of about 200 ft. diameter, a deep dry fosse surrounding a mount raised some 16 ft. above the present level of the fosse, which

was originally considerably deeper and filled with water. This earthwork was probably the site of the first manorial hold.



To the north-east is a large spring-fed pond, while immediately beyond the latter is a horse shoe-shaped water-girt enclosure of doubtful date and purpose.

It may represent a guarded spot for the shelter of stores and cattle in the days of early settlement in

the Kentish woodlands, but there is nothing tangible to prove that

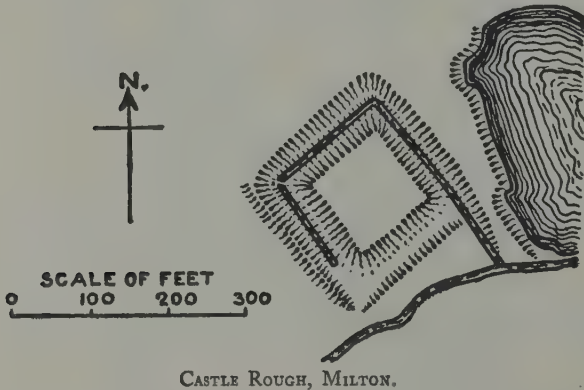
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the work is not due to more modern fancy on the part of an owner of the estate.¹

LAMBERHURST : SCOTNEY CASTLE.—This picturesque ruin will be described in another section of this History, but so much of its defence having depended on its wide and deep moat it is thought well to include a plan in this chapter.

LEEDS : LEEDS CASTLE.—Though one of the most remarkable feudal strongholds in England, this has so little defensive work of the class treated of in this article that it is not necessary to give a plan. The castle is wholly of stone, and its description will fall into another section of this History, but it is well to note the clever engineering which created a double island and rendered the place of great defensive strength even before the erection of stone walls and towers.

MILTON (near SITTINGBOURNE) : CASTLE ROUGH.—It is very doubtful whether this is the work thrown up by Hasten, the Dane, in A.D. 893, but as that view is held by many we mention the tradition.²



Though not large enough to serve an army it is probably of early date, and may have sheltered Danish marauders whose boats could lie protected in the water which flooded all the land immediately east and

south ; or perchance a Saxon or later settler here constructed strong defence against the Danish enemy.

The earthworks lie on slightly rising ground just where the marsh joins the higher land, sloping down from the west and within a short distance of Milton Creek.

The fosse, or moat, on the south-west side is about 12 ft. below the enclosed mount, and a little less on other sides.

As the top of the mount slopes gently from north-west to south-east it appears to be the original level of the hillside, little raised by ballast from the surrounding moat, which may have been used in rearing ramparts, some portions of which appear to have remained when Hasted wrote, but have now disappeared.³

MINSTER (ISLE OF THANET) : CHEESMAN'S CAMP.—The farmhouse known as Cheesman's Farm is in the parish of Acol, but the

¹ Colonel E. Wyndham Grevis Bailey, the owner, has an early print of the Court, which shows rectangular stew-ponds to the north-east of the circular work first mentioned.

² See Sittingbourne, Bayford Court, *post*.

³ Hasted, *Hist. Kent* (1782), ii. gives a striking bird's-eye view of the earthwork.

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earthwork adjoining it is in Minster and about two miles south of Birchington.

The enclosure that remains has much the character of a homestead moat, but when Hasted wrote there was apparently a further work on the opposite side of the road, and both showed more signs of defensive work. He regarded the camp as a place of retreat, buried in the woods, used by the Saxon inhabitants to retire to when the Danish pirates infested the isle of Thanet. The earlier name of the place seems to have been Chessmunds.

SITTINGBOURNE: BAYFORD CASTLE and COURT.—Of the former not a wrack remains, and probably like many other 'castles' it was mainly a moat-defended enclosure. Its site is shown by the Ordnance Surveyors on the eastern side of Milton Creek, about half a mile north by east of Bayford Court.¹

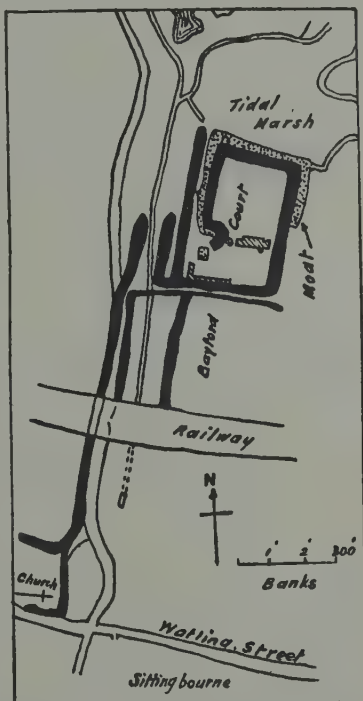
BAYFORD COURT happily retains evidences of the earthwork defences around the site. Not only does a moat enclose the main position on three sides, but also low ramparts or banks remain in places, extending from the parish churchyard to the court for some thousand feet or more.

Special attention is drawn to this work because Mr. Spurrell thinks it the fortress which the Danish army constructed in 893.²

Castle Rough in Milton is usually said to be the site of the work, but its form is against this view, and it would seem probable that the lines of work about Bayford Court are more likely to have sheltered the invaders when Hasten came 'with eighty ships into the Thames' mouth and wrought him a work at Middleton.'³

STANFORD: WESTENHANGER.—The fortified manor house, mainly dating from the fourteenth century, will be referred to in another section of this History; here it is sufficient to record the evidences which remain of its once broad and deep moat, fed by a stream which rises on the hill above Stanford church.

SUTTON AT HONE: ST. JOHN'S.—This interesting example of



BAYFORD COURT, NEAR SITTINGBOURNE
FROM PLAN BY MR. SPURRELL.

¹ Hasted (*History of Kent*, ii. 1782) refers to Bayford Castle in such manner as to suggest that his reference may be intended for what is now known as Bayford Court, and we cannot but conclude that mystery attaches to the exact spot occupied by the castle.

² 'Early Sites and Embankments,' *Arch. Journ.* (1885) xlii.

³ *Angl.-Sax. Chron.* A.D. 893

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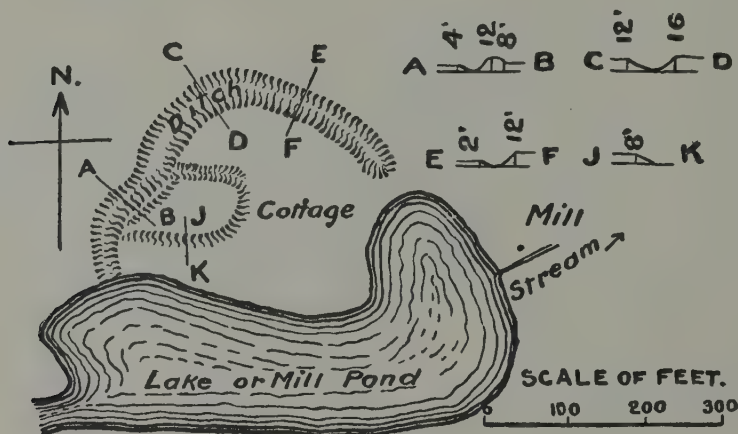
moating includes within the protected area some remains of a Commandery of the Knights of St. John of Jerusalem.

At Horton Kirkby, over two miles up stream, the river Darent is divided into two courses, which run, at Sutton, about a quarter of a mile apart; the remains, being on the eastern side of the western course, lie between the two streams, the western one forming one side of the moat.

TONGE CASTLE.—Tong, or Tonge, is on the low lands south of the Swale, only about 40 ft. above sea level.

There is evidence of a castle here soon after the Conquest, and it is highly probable that defences of some description guarded the site in earlier days.

With the Watling Street close by on the south and, on the north, a creek of the Swale,¹ the importance of the position to Saxon or Dane is



TONGE CASTLE.

manifest; either may have wrought a work here, but it was probably altered in late Norman times to accommodate buildings of masonry.

A large pond now occupies the southern portion, and though possibly a sheet of water aided defence on this side, it is more likely that the mill-pond is of later mediaeval date, its construction destroying much of what was before-time a stronghold of more power than its present poor remains suggest.

The moat, now much silted up, was doubtless deep enough to receive water from the strong springs which rise on the south-west of it to fill it, and there may have been a moat enclosing the raised platform, or keep, but the whole place is in so poor a state of preservation that any attempt to realize its former condition is somewhat difficult.

It will be noticed that an entrance exists on the east; this may be the original site, but in early times the access would have been by a

¹ The Swale is said to have been part of the main waterway from the continent to London from early days till the thirteenth or fourteenth century.

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drawbridge, the moat continuing till it joined the southern arm of the defensive work.

It is worth noting that slight as is the elevation of the castle site it is a conspicuous object owing to the low level of the adjacent land.

A road immediately north of the castle is claimed as a pre-Roman trackway by some antiquaries, but we are not aware of supporting evidence.

WALMER: CHURCH AND COURT MOATS.—Pritchard's *History of Deal* (1864) says 'round Walmer church . . . on a rise is a deep fosse.' So far as can easily be seen now there is but a ditch, or fosse, on the south side of the churchyard, and this was made only some sixty years ago! Yet Hasted found in his time 'a deep single fosse around,' and various writers have thought the spot a Roman camp.

Enquiry of the 'oldest inhabitant' and careful examination of certain traces reveal the fact that there truly was a fosse, but instead of surrounding only the churchyard, part of its ramifications enclosed the castle, or mansion, remains of which are in Walmer Court grounds. Thus we find this reputed 'camp' to be one of those enclosures, common in feudal days, which guarded the hall and the church of a Norman lord.¹

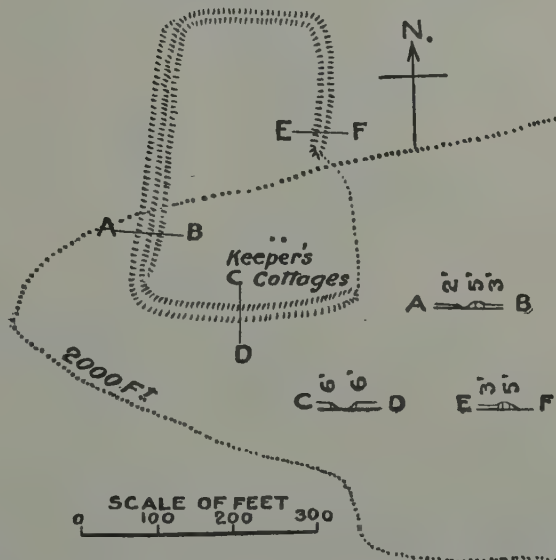
WESTENHANGER.—See STANFORD.

ANCIENT VILLAGE SITES

[CLASS H]

AYLESFORD: PRESTON WOODS.—Just within the parish boundary (half a mile south-west of Barming station) is the slight entrenchment named on the new Ordnance Survey a 'camp,' but more like the boundary of a wood. It stands upon ground practically level with the land, and the position has no natural defence. The entrenchments are very slight, as will be seen by the plan and sections, and granting a perfect rampart and ditch on all sides, the base is so exceedingly narrow, only 20 ft., that it would have little strength.

Leaving aside the 'camp' theory, which seems quite untenable,



ENTRENCHMENT IN PRESTON WOODS, AYLESFORD.

¹ The place was held by the Auberville family in the twelfth and thirteenth centuries.

A HISTORY OF KENT

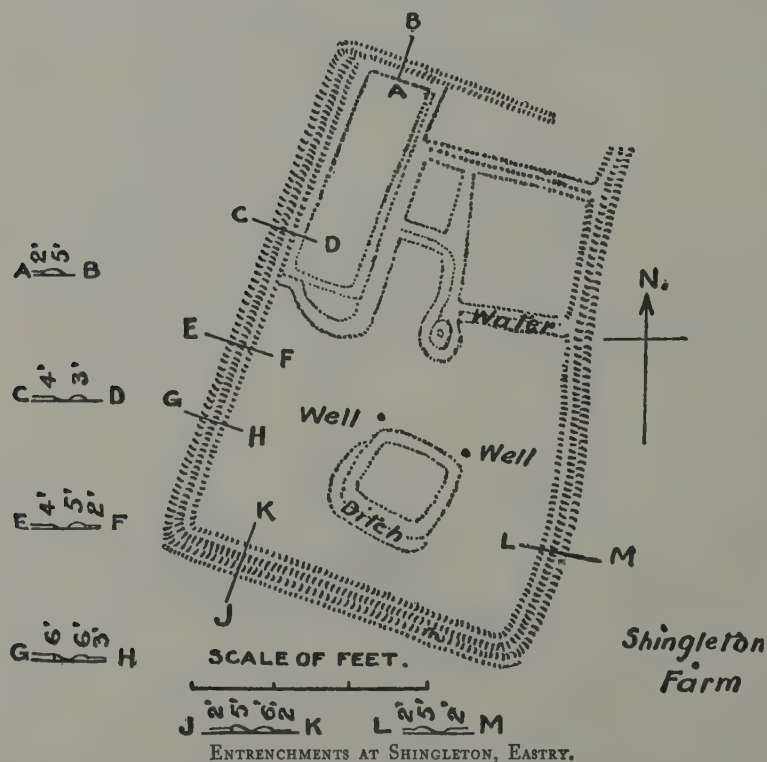
two hypotheses present themselves as to the purpose of such weakly protected inclosures. They may be the sites of ancient village settlements, or the pieces of land reserved in feudal and later days for the preservation of beasts of the chase.

This example is possibly too small for the latter purpose, and its banks and ditches may be the remnants of a never strong place guarded by a palisade of timber on the bank.

A similar work of a like size exists in a thicket at Navestock in Essex.

There are said to be traces of other earthworks on the west of Preston Wood inclosure, but we have not discovered them.

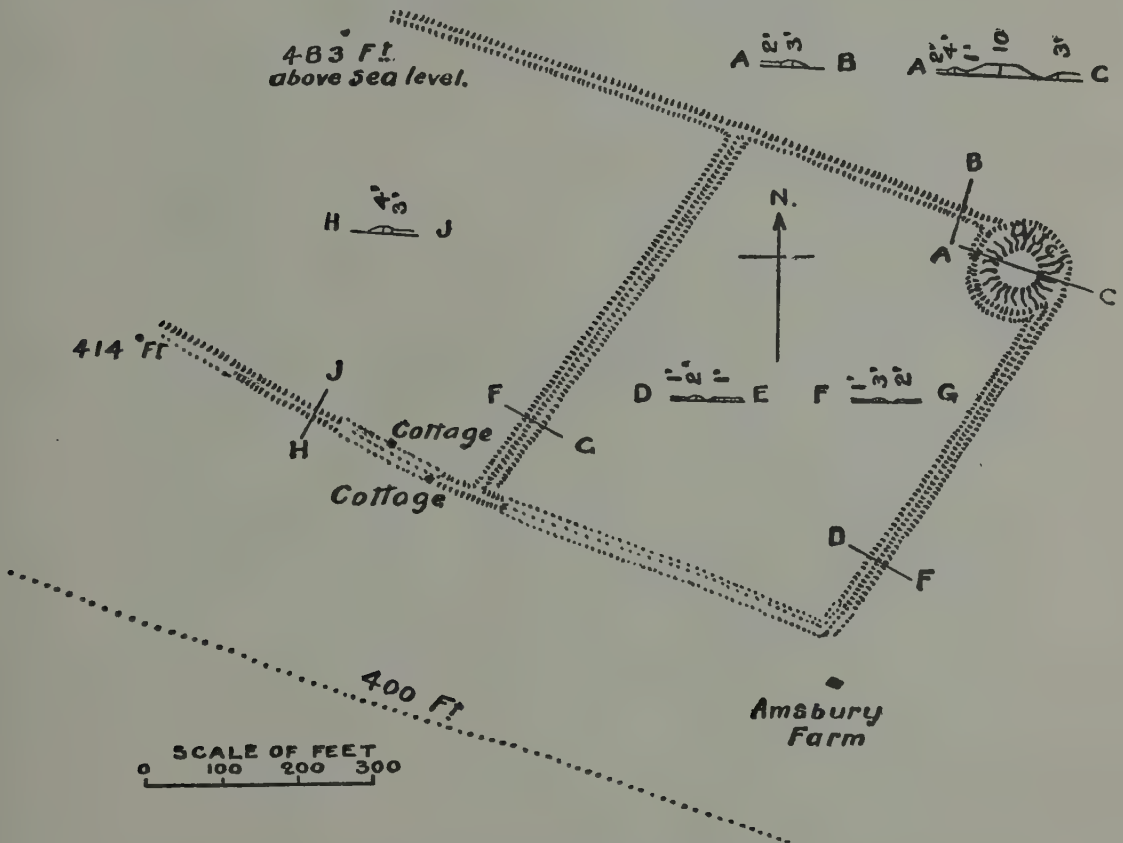
EASTRY : SHINGLETON.—This curious work is thickly matted over with underwood and nettles, and the earthworks are in a very poor state of preservation. Its ground is about 110 ft. above sea level, with higher land on all sides except the north-east. The position has no natural defence, for if the work were open and not covered with trees and underwood it would lie entirely exposed to the higher land around.



The outer entrenchment on the west consists of a ditch with the ballast thrown inward to form a rampart, but on the south besides the inner rampart a slight outer rampart is found, and on the north the only entrenchment consists of this slight rampart, but whether or not this is part of the original plan may be doubtful. The east side like the west

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lacks the outer rampart towards the south ; towards the north an impenetrable hedge prevents examination. The dotted lines within the enclosure show certain entrenchments, as indicated upon the Ordnance Survey map. Perhaps the surveyors examined the place at a time when the timber was cut down, but the writer could find little or no signs of this internal work, only in fact a shapeless heap with two deep holes, possibly wells, in about the position shown on the plan. The north portion of the enclosure is too dense to explore, except perhaps in the depth of winter in dry weather.



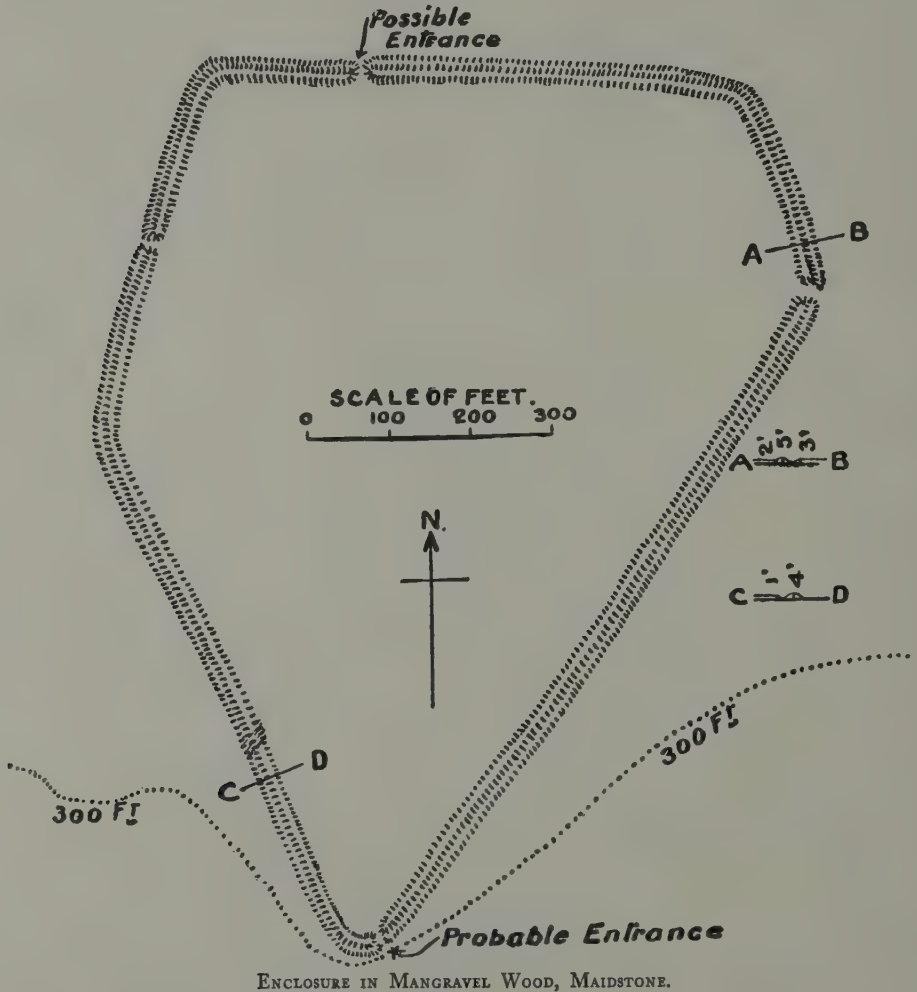
Although we have included such low-banked and slightly protected inclosures in this section it is doubtful whether they are, in some cases, anything more than banked and ditched sites of ancient woods reserved, maybe, for the preservation of beasts of the chase.¹ It has even been suggested that the Shingleton banks and ditches were the bounds within the circuit of which fairs were held in olden days, but authority is lacking.

¹ See notes on Preston Wood, Aylesford and Mangravel Wood, Maidstone.

A HISTORY OF KENT

EWELL, near Dover.—In Petrie's list of earthworks we find reference to lines of defensive work in Lousyberry Wood, also three tumuli.¹ The traces are vague and much destroyed, but there appears to have been a low-banked, nearly rectangular enclosure, with an outer line of bank on the north-east and south-east side.

HUNTON: AMSBURY.—This entrenchment stands upon undulating ground some 420 to 480 ft. above sea-level, and 400 ft. above the rivers



Medway, one and three-quarters of a mile north, and Bewlt, one and a half south. The position is to a limited extent naturally defended on the south by the fall of the hill, which however is of no great steepness. The form of the work is curious, and resembles neither that of an early fortress nor of a feudal stronghold. The mount occupying the north-east corner is fairly well marked, but is of small base and height, and has

¹ *Arch. Cant.* (1880), xiii.

ANCIENT EARTHWORKS

an irregular excavation on the summit. The other entrenchments are narrow of base, 21 ft. at the widest for the rampart and ditch together ; all now so poorly defined that it is hardly possible to recognize them as defensive earthworks. The whole is covered with underwood. Where the original entrances were is uncertain ; the mount however has a slight causeway, ancient or modern, on the west side.

LUDDESDOWN : HENLEY'S WOOD.—Here is a slight banking of polygonal outline, with a corresponding shallow rounded fosse on the outside, enclosing a considerable space which has been regarded as a 'camp.'

It is, however, one of those doubtful enclosures which may have been occupied as a British village settlement, or may be a piece of land imparked in feudal days. The present wood within which it is included extends beyond the lines of the earthwork ; the brushwood being very thick, examination can be conducted only with difficulty.

The earthwork was locally known as the 'Cam,' a word which indicated an ancient earthen mound or camp.¹

MAIDSTONE : MANGRAVEL WOOD.—This enclosure is without natural defence, standing upon ground which is practically level 300 ft. above the sea and 250 ft. above the river Medway, which flows two miles away on the north-west side. The entrenchments are exceedingly slight, the base of the rampart and ditch together being only 24 ft. wide, and though in their perfect condition they would have been rather better defined they could have formed no true defence. The shape of the enclosure is entirely artificial. What entrenchments exist are well preserved, and are within and upon the edge of a wood. The Ordnance Survey (1819) shows neither a wood nor this earthwork, but the later maps entitle it a 'British camp.' The site of original entrance is doubtful, but the north and south openings appear older than the others. An earthwork called the Coniger five miles west of Amesbury in Wiltshire is of the same shape and encloses tumuli.

The origin of such low-banked slightly-ditched enclosures is in most cases extremely doubtful.²

UNCLASSIFIED EARTHWORKS

[CLASS X]

APPLEDORE.—From the Saxon chronicle we learn that in A.D. 893 a part of the Danish army made a work at 'Apuldre,' but we have sought in vain for traces of a camp at Appledore.

North of the tract of land, immediately south-west, still known as the Isle of Oxney, flowed the river which drained the hinterland covered by the great forest of 'Andred'; where the water flowed are meadow lands, and it may be that the deposit of silt of which this now dry land is composed has buried the camp we seek, for doubtless it was placed

¹ Halliwell, *Dict. of Archaic Words, etc.*

² See notes on Shingleton in Eastry parish and Preston in Aylesford.

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near the water-side, as were the Danish works at Milton, Benfleet, and Shoebury.¹

Tradition says that a 'castle' stood where is now the church, and that it was destroyed by the French in 1380. If there be truth in this tradition we should think it just possible that the church stands within the area of what was an extensive outer court of a stronghold of, perhaps, early Norman days. On the south-west, where the ridge ends abruptly, in a commanding position overlooking the ancient waterways, is a small mount, wholly or partly of artificial construction, which may be a burial tumulus but is more likely the base of a keep-mount. Round part of it is a ditch, probably the poor remnant of a fosse filled with the accumulated detritus of the mount, and close by on the steep hill-side are traces of a spring of water, while on the other side, nearer the church, is a piece of level ground which, though now neither fossed nor ramparted, may well have been the base court of the keep.²

BLACKHEATH.—Towards the south-western corner of Blackheath, near the beginning of the descent to Lewisham, there remains a portion of an entrenchment which may be of ancient date, but the work is of far too slight a character to show its purpose or period.

There also remain other broken traces of banking which may be fragments of encampments. As the heath is credited with having been the site of a Danish camp in the eleventh century, and as Wat Tyler lay here in 1381, and Jack Cade encamped in 1449 and 1450, Henry VI in 1452, and others since, it is highly probable that extensive earthworks existed prior to the merciless destruction of the surface caused by the gravel digging, which lasted from 1818 till 1865.

DEAL CASTLE.—This, being one of Henry VIII's blockhouses, to be noticed in another section of the History, needs only to be mentioned here as being surrounded by a deep fosse with some masonry on the counter-scarp. Sandown Castle, also built by Henry, has now little left beyond the ruins of its foundations.

ERITH: LESNES.—In immediate proximity to the site occupied by Richard de Luci's twelfth-century abbey of Westwood in Lesnes, mainly just within the adjoining wood, are traces of earthworks which may have sheltered Saxon or Dane when the waters of the Thames almost touched the base of the high ground, and left a 'hoo' or dry shelf of land suitable for the settlement of an early community.

Now and for long past the marsh north of the position has been separated from it by a raised road³ which has closed in two little valleys (one on either side of the abbey site, but the eastern at a greater distance) once open to the Thames.

¹ The place-name *Apuldre* need not be regarded as exact location; it may be that Kenardington (which see *ante*) is the site both of the half-wrought Saxon fortress and of the work constructed by the Danes. The words of Ethelwerd's chronicle appear to imply that the Danish camp was erected on the site of the Saxon work.

² The traces being very vague, we have included this description in Class X, though it may properly belong to Class E.

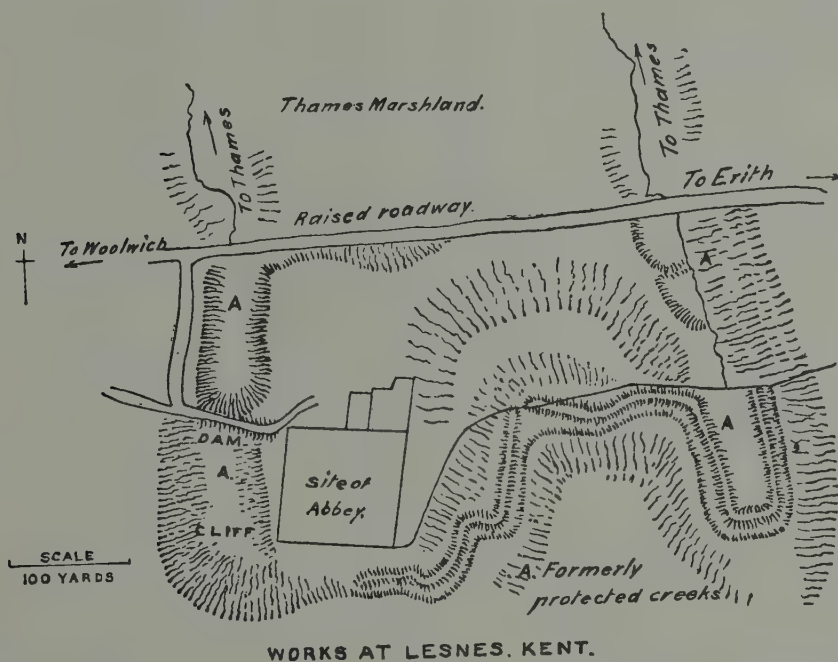
³ This road, once an embankment, is now a tramway.

ANCIENT EARTHWORKS

Mr. F. C. J. Spurrell, who examined the site with extreme care, writes :—

At the time when the earthworks were constructed the tides flowed up to these valleys across which the road passes. The eastern one has a square-shaped work around the bottom of the valley at a distance secure from the reach of the tide, and its bank on one side, if not on both, at one time continued much further northward (to the river) than it does now, in an irregular manner influenced by the shape of the ground. The square-shaped hythe wall continues westward up the hill, then in a general direction southward, skirting the hillside for some distance. The ditch all along this bank is landward, for the protection of the waterside community. It presents in section several peculiarities, and notably the upper angle; for here the hill rises so high and quickly that it required clever arrangement for protection at so unfavourable a spot.

All the rest of these works are lost in the improvements required by the abbey. The west valley is stopped by a dam, making an upper pond, while the roadway lower down formed another dam.¹



It is probably with accuracy we may picture these two creeks occupied by the vessels of Saxon or Danish settlers, vessels so light of draught that they could be drawn sufficiently high up the valleys to be sheltered from enemies by the protection of the ramparts and fosses.

GOUDHURST.—Entrenchments of great length exist in the woods south-east of Bewlt bridge. They are more or less joined in Shearnfold Wood and Cats Wood, but form no enclosure, and seem to partake of the nature of boundary banks rather than of defences. In these woods they may be traced for about 6,000 ft., and in Chingley Wood, Dunster's and Polecat Woods, near by on south-west, the Ordnance

¹ 'Early Sites and Embankments,' *Arch. Journ.* (1885) xlii.

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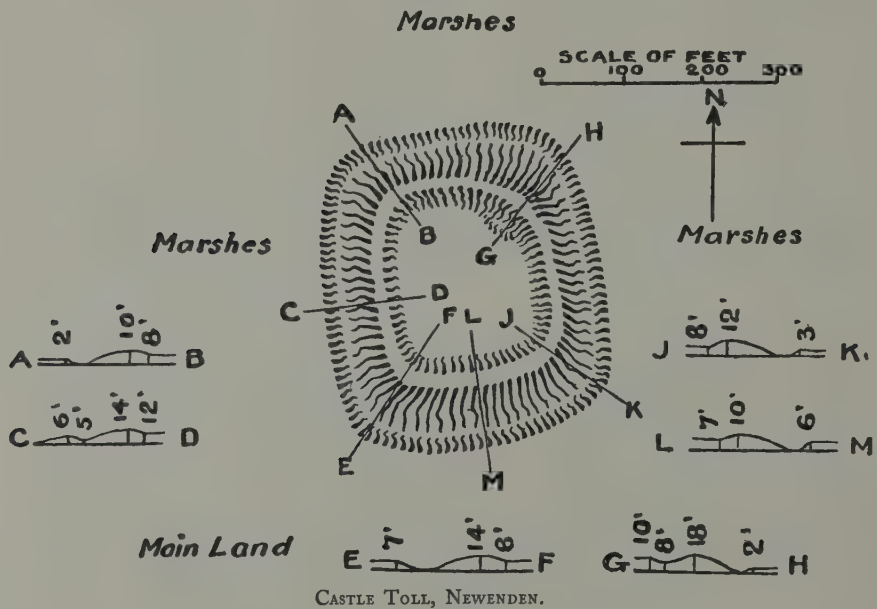
Maps show over 5,200 ft. length of similar work ending at the bank of the river Bewlt.

Some light on their original purpose may, perhaps, be afforded by the case of the remains in Chingley Wood. This manor was divided in Queen Elizabeth's reign, when Thomas Darrell sold a moiety of it to William Campion.

Is it not likely the bank was then raised to mark the boundary between their lands?

LITTLEBOURNE: FISHPOOL HILL.—Some traces of scarping or banks, possibly indicative of ancient defensive work, are traceable in the wood close to the road between Canterbury and Sandwich.

NEWENDEN: CASTLE TOLL.—This earthwork occupies the extreme end of a tongue of land projecting east-north-east into the low marsh



land between the river Rother and its tributary the Hexden Channel, which runs from the north-west and joins the Rother a mile and a quarter south-east. The enclosed portion is about 20 ft. above sea-level. The position was naturally defended on the west, north and east by the morass or wet marsh (now drained), and probably when the fortress was constructed the tidal water approached closely on these sides. The entrenchments are simple, consisting of a fosse with the ballast thrown inward to form a rampart, once of considerable length. The soil being gravel and clay, the height of the rampart and depth of the ditch have been greatly reduced; moreover the work has been under the spade of the explorer, or mutilated in removing material for agricultural purposes, and cones have found the bank a handy burrowing place.

The north-east corner, like that on the south-west, is higher than

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the rampart at other points. The former has the appearance in its present condition of having been a 'mount,' but this appearance is mainly owing to the destruction of the rampart on both sides and a slight dip on the inside, and it may be noted that the base of this corner is narrower than the base of the rampart at the south-west.

Though it is outside the province of this article to discuss at length the period of its construction it may be said that this fortress, and its relation to the surrounding country, cannot be viewed without feeling it probable that the work is due either to Danish marauders, who came here by water and made this the base for raids on the rich lowlands, or to Saxons who reared it as a preventive station to check such inroads.¹

According to some authorities this is the site of *Anderida*, but we find no evidence of Roman work.

To the south of the earthwork, at a short distance, are traces of further moating and scarping, which probably formed part of a large enclosure of nearly triangular form with Castle Toll at its extreme north-east point, and may be of earlier date than the latter.

Castle Toll is regarded by some antiquaries as a much mutilated example of a Norman 'mount and bailey' stronghold, while others think it a simple enclosure such as Saxons and Danes constructed, the lofty ramparts of which have been reduced, save at the north-east and south-west angles, leaving what appear as mounts at these corners. Under the circumstances, we have thought it best to include the work under Class X.

POULTON.—Close to St. Radigund's Abbey are irregular trenches extending over about forty acres of land. From the appearance of the outer lines of work this has been considered an ancient oppidum, but as the foundations of many walls, etc., have been found it is possible that the whole belongs to the mediaeval period.

These works extend towards Poulton Farm, where are various banks which may be traces of ancient defence.²

RINGWOULD: 'ROMAN CODDE.'—In the valley at Kingsdown are said to be vestiges of an ancient camp referred to by old antiquaries under this curious name; but the traces are too vague to justify faith in the existence of any kind of defensive work at any time.

RIPPLE: DANE PITS.—Because Hasted and subsequent writers have referred to this earthwork we record its former existence. Hasted wrote, 'An entrenchment of an oblong square, comprehending about half an acre, with various little eminences in it.'³

The whole was ploughed over some forty years ago, but the land is now pasture, and standing by the site, nothing of Dane Pits is visible, but from the height of the hill on which Ripple windmill stands a clear definition of their area is discernible by the dip in the ground.⁴

¹ R. Kilburne, in his *Topographie, or Survey of the County of Kent* (1659), says: 'In this Parish, neer the Priory, stood a Castle, which was destroyed by the Danes in the year 892. . . . Only the memory of the same is preserved, by a place there, still called Castle Toll.'

² See Mr. G. Payne's list, under Alkham, in *Arch.* (1889), li.

³ *Hist. Kent* (1799), iv. 134.

⁴ Information kindly supplied by the Rev. H. L. Beardmore.

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From Hasted's drawing we suppose the work to have been for sepulchral rather than defensive purposes.

SANDGATE : THE CASTLE.—Its deep moating, remaining to this day, necessitates mention of the castle built by Henry VIII in this section, but the story of the structure and its partial alteration in 1806 will be found in a later section of the History.

SUTTON, near RIPPLE : WINGLETON OAKS.—In a pasture field north-west of the farm-house, known under this name, or the perverted form Winkland Oaks, are considerable remains of what appear to have been military works. They are in poor condition, consisting of ridges and broken banks, or mounds, and cover about half an acre of land. A small part of the area is in the adjoining parish of Ripple.

WALMER : CASTLE.—This much modernized blockhouse, originated by Henry VIII, will be described in another part of this History ; here we need say no more than that its formidable fosse can still be noticed, though converted into a garden.

BARHAM DOWNS

Under this heading we may refer to the numerous fragmentary earthwork remains in various neighbouring parishes.

The Downs are at an altitude of about 200 ft. above sea and 100 ft. above the Lesser Stour, the river which flows at the foot of the Downs on the west, and extend for some four miles from north-west to south-east, carrying along the summit the old Watling Street, now, with slight deviations, the high road from Canterbury to Dover.

On the east of the road, parallel thereto, at a distance of about 500 ft. (opposite to Charlton Park and Kingston on the other side of the river), runs a conspicuous earthwork, shown in the Ordnance Survey map, over 2,000 ft. in length, in parts now rather a mere scarping of the hillside than a true entrenchment, with a rectangular three-sided projection apparently guarding two ways of entry to the higher ground occupied as a camp. This line of work appears to be the best defined portion of those extensive traces which have been discussed by the Rev. F. T. Vine ; indeed it may be said to be all that remains visible, though Mr. Vine wrote :—

There were probably two large oblong castra, the one extending along Barham Downs opposite Charlton, the other at the (north) western extremity of the Downs, extending over part of Bridge Hill, Bourne Park, and perhaps the grounds of Higham.¹

Stukeley gives a view of 'Cæsar's Camp' overlooking Kingston church lying in the valley to the west.² Stukeley's imaginative power was great, but the work is too carefully delineated to permit us to suppose that it was not in good preservation when the old antiquary sketched it in 1722. He gives its measurements as thirty paces by sixty. This is probably the now three-sided enclosure above mentioned.

¹ *Cæsar in Kent* (ed. 1887), 186.

² Stukeley (W.), *Itinerarium Curiosum : The Brill*, 1776.

ANCIENT EARTHWORKS

At Denne Hill Park, in Womenswold parish, were traces of extensive earthworks, and from Hasted's words it appears that he regarded 'Denhill' as Cæsar's main camp, and from the great number of (now invisible) entrenchments he mentions in the neighbourhood as being related to the main work, it is evident that the recent destruction of such relics must have been enormous.¹

On the western side of the river, opposite Barham Downs, are faint traces of long lines of works which Mr. Vine considered may have been constructed by the Britons, but they appear to us more to resemble the sites of old hedgerows than military entrenchments.

About a mile and a half north-east of the Downs, just above the marshland of the Lesser Stour, is the hill known as Garrington (Domesday, *Warwinton*), upon which are scarped and terraced lines, maybe the remains of the defences of a British *oppidum*.

Barham Downs are recorded as the place of encampments of armies and troops at various times from the thirteenth to the eighteenth centuries, and possibly these temporary tenants may have created some and modified others of the works of which scraps exist.

Our great regret is that, so fragmentary and doubtful are the remains, we may not devote space to plans and descriptions of them.

TABLE OF REFERENCES

WITH SITUATION OF SITES OF EARTHWORKS

Allington (by Maidstone)	E	Deal	X
Appledore (6 m. S.E. Tenterden) . . .	X	Dover	E
Ash (2½ m. W. Sandwich)	F C	Eastry (7½ m. N.W. Dover)	H
Aylesford (3½ m. N.W. Maidstone) . .	H	East Wickham (3½ m. N.W. Crayford) .	F
Benenden (3½ m. S.E. Cranbrook) . . .	F	Edenbridge (6 m. S. Westerham) . . .	F (2)
Bigbury, see Harbledown		Eltham	F (2)
Bilsington (6½ m. S.E. Ashford) . . .	F (2)	Erith	X
Blackheath	X	Ewell (3 m. N.W. Dover)	H
Boughton Aluph (4½ m. N.E. Ashford)	F	Eynesford (7 m. S. Dartford)	G
Boughton Malherbe (2 m. S.W. Lenham)	G	Folkestone	E F
Brenchley (9 m. S.W. Maidstone) . . .	D F	Frittenden (2 m. S. Staplehurst) . . .	D
Bromley	F (2)	Goodnestone (2½ m. S.E. Wingham) .	F
Canterbury	C E	Goudhurst	X
Capel (5 m. S.E. Tonbridge)	F (2)	Great Chart (2 m. S.W. Ashford) . . .	F (2)
Charlton (near Woolwich)	B	Greenwich Park	C
Chart, see Great Chart		Groombridge Place, see Speldhurst	
Chevening (4 m. N.W. Sevenoaks) . . .	F	Harbledown (near Canterbury) . . .	B
Chilham (6½ m. S.W. Canterbury) . . .	E	Harty (on Sheppey Isle)	F
Chislehurst	F	Hawkhurst (5 m. S.W. Cranbrook) . .	F
Cobham	B (2)	Herne (2 m. S. Herne Bay)	F
Coldred (5 m. N.W. Dover)	B	Hever (3 m. S.E. Edenbridge)	G
Cooling (5 m. N. Rochester)	G	Horsemonden (2 m. N.W. Goudhurst)	F
Cowden (5 m. S. Edenbridge)	F	Hunton (4 m. S.W. Maidstone)	H
Cranbrook	F (2)	Iffin Wood, see Nackington	
Crayford (by Dartford)	C F	Ightham	B F G
Darenth (near Dartford)	B	Iwade (3 m. N. Sittingbourne)	F
Dartford	C	Joyden's Wood, see Dartford	
		Judd's Hill, see Ospringe	

¹ *Hist. Kent* (1790), iii. 752-3.

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Kenardington	B	Saltwood (by Hythe)	E
Keston (3½ m. S.E. of Bromley) . . .	B	Sandgate (by Folkestone)	X
Kingsnorth (3 m. S. Ashford) . . .	F	Sandwich	C
Knox Bridge, see Frittenden		Selling (5 m. S.E. Faversham) . . .	B D
Lamberhurst (partly in Sussex) . . .	G	Sevington (2½ m. S.E. Ashford) . . .	F
Leeds (5 m. S.E. Maidstone)	G	Sheppey Castle, see Queenborough	
Leigh (3 m. W. Tonbridge)	F	Shipborne (4 m. N. Tonbridge) . . .	F
Lesnes, see Erith		Sibertswold (1 m. N. Coldred) . . .	C
Leybourne (4½ m. N.W. Maidstone) .	E	Sissinghurst, see Cranbrook	
Littlebourne (4 m. E. Canterbury) . .	X	Sittingbourne	G
Loose (3 m. S. Maidstone)	B	Speldhurst (3 m. N.W. Tunbridge	
Luddesdown (1½ m. S. Cobham) . . .	H	Wells)	F
Lympne (3 m. W. Hythe)	C	Stanford (3 m. N.W. Hythe)	G
Maidstone	H	Staplehurst (4 m. N.E. Cranbrook) . .	F
Marden (5 m. N.E. Goudhurst)	F	Stockbury (4 m. S.W. Sittingbourne) .	E
Mersham (4 m. S.E. Ashford)	F	Sutton Valence (4½ m. S.E. Maidstone)	F
Milton (by Sittingbourne)	F G	Sutton-at-Hone (3 m. S. Dartford) . .	G
Minster (5 m. W. Ramsgate)	G	Sutton (1 m. S.W. Ripple)	X
Nackington (3 m. S. Canterbury) . . .	B	Swanscombe (3½ m. W. Gravesend) .	B (2) D
Nettlestead (6 m. S.W. Maidstone) . .	B	Teynham (5 m. E. Sittingbourne) . . .	B
Newenden (5½ m. S.W. Tenterden) . .	F X	Thanington (2 m. S.W. Canterbury) . .	F
Newington (3 m. E. Sittingbourne) . .	B	Thornham (4 m. N.E. Maidstone) . . .	E (2)
Oldbury, see Ightham		Tonbridge	E
Ospringe (1 m. W. Faversham)	B	Tonge (2 m. E. Sittingbourne)	G
Pluckley (3 m. S.W. Charing)	F	Walmer (by Deal)	G X
Postling (3 m. N.W. Hythe)	B	Westenhanger, see Stanford	
Poulton (3½ m. W. Dover)	X	Westerham	B
Queenborough (2 m. S. Sheerness) . .	D F	Westwell (3 m. S.E. Charing)	F
Reculver (3 m. E. Herne Bay)	C	West Wickham (1 m. S.W. Hayes) . . .	B
Richborough, see Ash		Wittersham (5½ m. S.E. Tenterden) . .	F
Ringwould (4 m. S. Deal)	C X	Woodnesborough (2 m. S.W. Sandwich)	F (2)
Ripple (3 m. S.W. Deal)	C X	Wouldham (3½ m. S.W. Rochester) . .	D
Rochester	C E	Wrotham (11 m. N.W. Maidstone) . . .	F
Rolvenden (2½ m. S.W. Tenterden) . .	F	Yalding (5½ m. S.W. Maidstone) . . .	F

APPENDIX I

THE DENEHOLES OF KENT

In the counties of Kent, Essex and Durham certain ancient artificial caverns have received the traditional name of deneholes, daneholes or danesholes from the dwellers in those districts in which they are found. The eminent philologist, Dr. J. A. H. Murray, is of opinion that this name implies that these caverns were made either by the Danes, or by people fleeing from the Danes, the word deneholes being simply an earlier form of danehole. They are doubtless associated with the Danes, because they were the latest and best remembered of pirates.

Caverns known by this name in Kent, Essex and Durham are usually found within some six or seven miles from the sea or of some stream capable of giving passage to the small ships used by the Danes and by the earlier Saxon and other pirates. Thus, in Durham, they are noted by Mr. W. H. D. Longstaffe as abounding in the neighbourhood of Embleton, six or seven miles west of Hartlepool, and in the southern counties they may best be seen about Bexley in Kent, and between Purfleet and Stanford-le-Hope in Essex. In Durham they are described as 'excavations in the sides of eminences'; in Kent and Essex they appear to be entered invariably by means of vertical shafts.¹

From the fact that the chalk is the only hard rock existing in Essex and Kent where deneholes abound, deneholes ending in chalk have naturally been more or less preserved, while

¹ For the Durham deneholes, see Mr. Longstaffe's paper on 'Durham before the Conquest,' read at the Newcastle meeting of the Archaeological Institute in 1852.

ANCIENT EARTHWORKS

those in sand, gravel or loam have perished. For the latter, which would usually need strengthening by means of timber and other supports, make their sites known, in almost every case, when their sudden collapse has caused a subsidence at the surface. This connexion of well-preserved deneholes with the chalk has tended to the identification of deneholes with pits *in* chalk, if not *for* chalk. And the fact that in certain localities, where chalk is near the surface, it has sometimes been sought (by those requiring it for lime, or for manuring clay land) by means of shallow pits with vertical shafts, has caused a confusion between deneholes and 'chalk-wells.' Of course, whether a particular pit in the chalk is a chalk-well or a denehole—in other words whether it was made for the sake of the material extracted, or to obtain an excavation for a secret storehouse or other domestic purpose—is a question to be decided upon the evidence afforded in each particular case.

Pits of both kinds have been noted by ancient writers as existing in Britain. Pliny¹ speaks of chalk-wells in describing the extraction of chalk 'by means of pits sunk like wells with narrow mouths, to the depth, sometimes, of one hundred feet, where they branch out like the veins of mines; and this kind is chiefly used in Britain.'² On the other hand, Diodorus Siculus states that the people of Britain had mean habitations, made for the most part of rushes and sticks, and that their harvest consisted in cutting off the ears of corn and storing them in pits underground, some of the corn which had been longest stored being taken out each day for food.

To illustrate the fact that pits traditionally called deneholes have no necessary connexion with the chalk, it may be well to note here that at Billericay, Essex (where the top of the chalk must be at least 500 ft. below the surface) it is recorded³ that a young labourer's father informed Mr. J. E. K. Cutts, in 1871, that an 'excavation like a gravel pit' was a 'denehole which had caved in.' It is also stated on the same page that a series of deneholes in Mucking Woods 'was filled up within the last few years, and these were in sand.' Turning to Kent, we learn from Hasted⁴ that deneholes were once numerous on Dartford Heath, and that some there were in the sand: 'About a mile south-westward from the town is Dartford Heath, where there are a great many of those pits and holes, so frequent in these parts. Some of these reach as low as the chalk, others no farther than the sand; many of them have been stopped up of late years, to prevent the frequent accidents which happen of men and cattle falling into them.'

The existence of deneholes at Tilbury on the Essex side of the Thames, and of some at or near Crayford, Faversham and some other Kentish localities is noted by Camden. Hasted, in his *History of Kent*, mentions some in the Isle of Thanet and elsewhere. But the fullest list of places in Kent is that given by Mr. F. C. J. Spurrell in his paper on 'Deneholes, and Artificial Caves with Vertical Entrances.'⁵ This paper was read before the Archaeological Institute in April, 1881, and is the earliest in which deneholes and pits, ancient and modern, more or less resembling them, as regards the purposes of their constructors, are fully treated in a scientific spirit. Mr. Spurrell gives, as denehole localities, Blackheath, Kidbrooke, Charlton, Eltham, Bexley, Crayford, Greenhithe, Swanscombe, Cobham, Rochester, the land between Greenstreet and Teynham Railway Station, and the country around Sittingbourne. He also mentions Halstead, Knockholt and Cudham. To these may be added the Chalk Downs near Lenham, and Lydden and Alkham near Dover, also Darent and Stone.

In many of the above localities, however, those wishing to see and examine deneholes for themselves would find no examples sufficiently well preserved to be inspected, though here and there their sites might be pointed out, or traditions of their former existence be obtained. For where they are scattered singly they are usually discovered at the present day through the sudden appearance of a subsidence at the surface, which marks the site of an imperfectly filled-up shaft. This is especially likely to be the case where the land is above the average in fertility or where the population living on it has greatly increased. But where the land is poor and population scanty, or where deneholes are collected in numbers so large as to make any attempt to use the land they occupy for agricultural purposes ridiculous, there they may be found preserved from all destructive influences but those of the weather operating during centuries of disuse.

In giving some description of a few examples of the deneholes of Kent, it seems best to begin with those which are wholly, or almost wholly, in the chalk, as they are, in the main,

¹ Nat. Hist. lib. xvii. cap. 8.

² Palin, *More about Stafford*, p. 40.

³ *Arch. Journ.* xxxviii. 391-409; xxxix. 1-22.

⁴ Trans. C. Roach Smith, *Coll. Ant.* vol. vi.

⁵ *Hist. of Kent*, i. 226.

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shallower and simpler in form than the deeper pits, and in many cases probably older. Good examples of these were discovered by Mr. Spurrell in a chalk cliff in Crayford brick-fields.¹ One of the pits measured from the surface to the chalk about 18 ft., thence to the floor 17 ft. 6 in. 'From this floor rose an obtuse cone of sandy clay, very hard, 6 ft. high, washed in very



A. Neolithic layer.
B. Roman layer.
C. Post-Roman layer.
D. Stratum of flint.
E. Chalk.
F. Sand and Gravel.

FIG. 1. SHALLOW
DENEHOLES NEAR
CRAYFORD.

slowly and evenly by the rain. In the cone were found several flakes, worked scrapers and a "core," but no pottery; above this lay coarser soil, several sorts of pottery, some made with shells, some with chalk, and ornamented by the finger-nail; higher up still Roman pottery, a fine Samian plate, and bones and rubbish to the surface' (fig. 1).

In 1883 I had an opportunity of descending one of the best preserved deneholes of the neighbourhood of Lenham, which lies at the foot of the chalk escarpment of the North Downs, about nine miles east-south-east of Maidstone. All the pits shown me by Mr. J. T. Hatch were on the top of the chalk escarpment, and on the highest ground in the neighbourhood. They were scattered here and there in groups of two, three, or more. Thus, there were two close together north of Pivington Farm, near the north-eastern corner of the wood. One of them still preserved its original shape and was about 27 ft. deep. North-east of Pivington Farm is a little cluster of houses called Warren Street. Two roads diverge from its southern end, one to Rayner's Farm, the other to Waterditch Farm. In the field in the angle between

these roads two pits had tumbled in. They appeared as steep-sided circular holes, perhaps 12 ft. deep and 15 ft. in diameter. In another field west of Warren Street, and on the north side of the road thence to Pivington Farm were slight hollows marking the position of five more pits. This field is the one crossed by the parish boundary, which is generally on the lines of hedges. Towards the middle of the field west of that just mentioned the sites of three more pits were seen, one of them being of considerable depth. Proceeding in a north-westerly direction along the footpath which touches the southern boundary of Birch Wood, we saw (where the next wood comes close to the footpath) three pits close together. And on the eastern margin of the wood traversed by the footpath, and about 100 yds. north of the path, we came to an open pit. Here Mr. Hatch had been good enough to furnish the means of descent in the shape of a long ladder. The depth was found to be about 38 ft., the uppermost 5 or 6 ft. of the shaft being in loam with flints, the rest in chalk. The pit appeared to have been at one time of a simple bee-hive shape like that at Crayford (fig. 1). From its sides, however, five galleries had been driven, which radiated from the centre at nearly equal distances from each other, but varied considerably in height and length. From their height at the entrance it is possible that these tunnels may have been begun before the cavern had quite attained its present depth. Measuring across from the ends of two nearly opposite chambers we found the greatest diameter to be about 40 ft. (fig. 2).²



FIG. 2. PIT
NEAR LENHAM.

On 4 April, 1906, I accompanied Mr. Sargent, Mr. Beeston and others to Lydden and Alkham. The district is one in which the chalk, with a gentle slope down to the north-east, is, on the higher ground, between 400 ft. and 500 ft. above the sea; the villages (such as Lydden and Alkham) being mostly in the intersecting valleys. The highest ground is usually capped by a deposit of clay with flints, while at the bottom of the valleys are sometimes alluvial deposits of gravel, sand and loam. The group of pits visited at Lydden consisted of three close together, near the top of the hillside north-east of the village and south-west of Cane Wood, the height above the sea being about 420 ft. The depth from the surface to the bottom of the shaft in the first pit visited was 22 ft. or 23 ft. The symmetry of the chambers had been obscured by a 'pipe' in the chalk, which had checked excavation in its vicinity, and by a fall of the roof in another quarter; also by an operation which had been begun, but not finished,

¹ *Arch. Journ.* xxxvii. under the title, 'Account of Neolithic Flint Mines at Crayford, Kent.' The author corrected the erroneous description of these pits as 'flint-mines' in his subsequent paper on 'Deneholes,' etc., already referred to.

² For being able to inspect some deneholes near Dover, at Lydden and Alkham, I am much indebted to the kindness of Mr. F. G. Sargent, residing at Shepherdswell; while for the plans and sections of those visited I am greatly obliged to Mr. W. Beeston, of Shepherdswell and Dover. Both gentlemen had long taken much interest in deneholes, and Mr. Sargent was good enough to invite me to visit those in his district, in which (so far as I know) their existence has not hitherto been recorded.

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to deepen the pit. This had resulted in the leaving of 'benches' towards the end of each chamber. The 'passages' of the plan (fig. 3) appeared to be of later date than the rest of the excavations.

The second pit of this group (fig. 4) was also somewhat obscured by the non-completion of a process of deepening similar to that which had been in progress in the first. The depth of the shaft was about 30 ft.

Proceeding to Alkham, we found 'Moseling's Hole' near the top of a hillside, 400 ft. above the sea, half a mile south-east of Alkham church, where the height of the surface is about 225 ft. This pit was rather more than 50 ft. deep, and extremely simple in shape (fig. 5). A leading feature was the great height, about 30 ft., and very slight length of the three chambers diverging from the shaft. In this case the deepening was evidently completed while the pit was still in use, and must have been in progress since it began to be used.

It is evident that these Lydden and Alkham pits resemble those of Lenham in general character and in position. They are alike in being at some little distance from the centres of habitation, and in being grouped in twos and threes. Now there is nothing in the localities in which they are found to suggest a special demand for chalk there, in ancient times, for lime or for the manuring of clay land. Nor is there anything in the shape and position of these

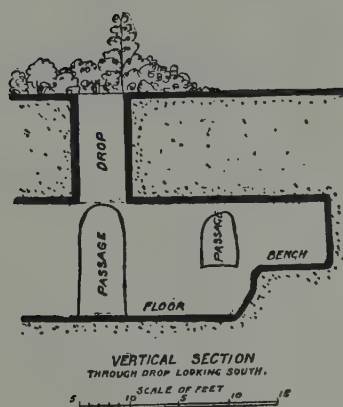


FIG. 3.

NO. 1 DENEHOLE AT STONEHALL FARM, LYDDEN.

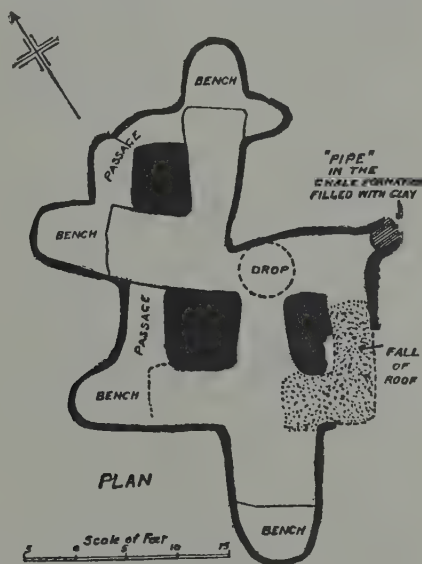


FIG. 3A.

pits to make them a means by which such a demand—did it exist—could be profitably supplied. They are neither well formed nor well placed for such purposes. On the other hand, their close grouping in twos and threes in out-of-the-way spots (though unintelligible on the chalk-well hypothesis) is precisely what might be expected if they were once secret family storehouses.

Leaving the wilder parts of Kent we come to Bexley, where unquestionable deneholes are not only more numerous than elsewhere, but where they may best be examined. For, as already mentioned, pits scattered singly here and there have generally been more or less filled up to prevent accidents, if they have not collapsed, or been choked up, through the influence of the weather during centuries of disuse. But groups of some forty or fifty deneholes concentrated as closely as the separation of each pit from its neighbours allows (like those of Stankey and Cavey Spring, Bexley), have a much better chance of survival, for the small compact area they occupy has obviously been rendered unfit by them for every other purpose, and can only be fenced in and let alone.

Deneholes are scattered around Bexley, as about Crayford and Dartford, but at Stankey Wood, a few yards west of the mansion known as Baldwyns, close to the south-western corner of Dartford Heath, there is a group of some forty or fifty; while another of similar size, equally

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concentrated, exists in Cavey Spring, a small part of Joyden's Wood, 500 or 600 yds. south-west of Stankey. A third group exists on the Essex side of the Thames at Hangman's Wood near Grays Thurrock. All three groups have a general similarity. All the pits end in chambers in the chalk, their shafts passing through the Thanet Sand, which is capped invariably at Hangman's Wood by gravel, and occasionally in the two Bexley groups. The depth from the surface to the floor of the chambers beneath is about 80 ft. at Hangman's Wood, and varies from about 40 ft. to 70 ft. at Stankey or Cavey Spring. And in all three cases, though the depth to the chalk is so considerable in each, there is plenty of bare chalk within a mile. Nothing, therefore, can be more evident than the fact that in all these groups we have unquestion-

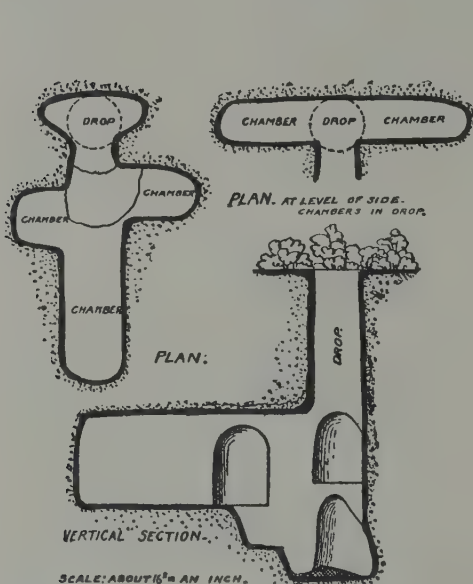


FIG. 4. No. 2 DENEHOLE AT STONEHALL FARM, LYDDEN.

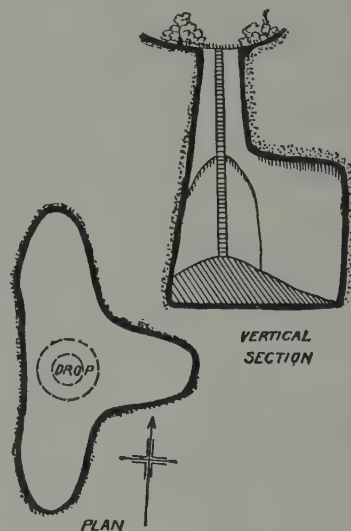


FIG. 5. 'MOSELING'S HOLE,' CHURCH ALKHAM.

able deneholes—not chalk-wells. The Bexley groups are not so near the Thames as that at Hangman's Wood. This is probably due to some extent to the existence of the Darent on the Kentish side, which would allow of the passage of small ships or boats—such as ascended the river Lee and were blockaded there by King Alfred—while there is no similar stream at Grays Thurrock.

Judging from those Bexley pits which are figured in Mr. Spurrell's paper, and from such as I have had opportunities of inspecting myself, the general plan of excavation in all the three groups was similar. But in Hangman's Wood more lateral space seems to have been allowed to each pit than at Stankey or Cavey Spring. Hence, while the double trefoil shape seems to have been the prevalent one in all three groups, the requirements of additional space have been met at Bexley by the removal of the greater part of the original partition between adjacent chambers, pillars being left to support the roof, as shown in progress in figures 6 and 7. The greater amount of lateral space allowed at Hangman's Wood appears to have prevented the need there for development of this kind. A comparison of the Stankey and Cavey Spring pits (figs. 6 and 7) with the Hangman's Wood pit (fig. 9) will illustrate this point. And if the Stankey pits shown in plate II in Mr. Spurrell's paper be compared with the pits at Hangman's Wood (seen in the ground plan given with the Report of the Denehole Exploration there) ¹ it will



FIG. 6. STANKEY PIT.

¹ Report on the Denehole Exploration at Hangman's Wood, Grays, 1884 and 1887. By T. V. Holmes and W. Cole. Also Notes by E. T. Newton, F. W. Rudler, F. J. Bennett, H. B. Woodward and F. C. J. Spurrell, *Essex Naturalist*, December, 1887.

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be manifest that there is nothing exceptional (as regards the space allowed) in the examples here given.

The pit shown in fig. 8 is near the eastern margin of Joyden's Wood. Its position is about 460 yds. due east of the 'summer house' marked on the six-inch Ordnance map. Not being a member of a compact group, but one of a number of single pits scattered about Joyden's Wood, the makers have evidently excavated simply as their convenience suggested, unrestricted by those rules for the common advantage enforced in Stankey and Cavey Spring.

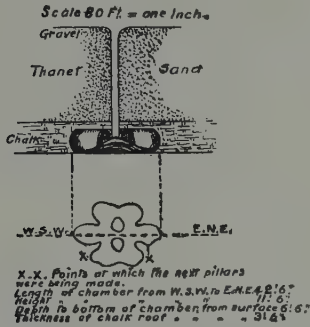


FIG. 7. CAVEY SPRING PIT.

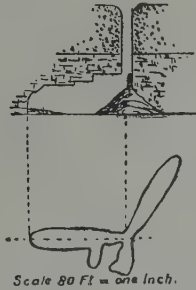


FIG. 8. JOYDEN'S WOOD PIT.

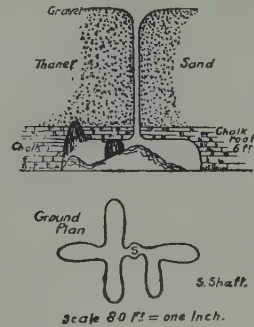


FIG. 9. HANGMAN'S WOOD PIT.

While Bexley is certainly the best centre in Kent for the exploration of deneholes, as the one spot where they may be studied both scattered and in groups, there is some evidence for their existence at Eltham and Blackheath. For deneholes in those localities, if ending in the chalk, must not only be considerably deeper than any hitherto mentioned, whether on the Kentish or the Essex side of the Thames, but must have been constructed under difficulties arising from the geological structure of the ground, absent elsewhere.

On 1 March, 1878, Mr. W. M. Flinders Petrie read a short paper at a meeting of the Royal Archaeological Institute (which was afterwards published in the *Archæological Journal*) on a remarkable shaft and subterranean chamber lately discovered in Eltham Park, the seat of Mr. T. Jackson. From this paper we learn that, in order to remedy a considerable leakage in the water supply, workmen were ordered to trace the course of the water that escaped. It was found to run into a disused brick drain, which ended at the top of a deep shaft. The ground above the shaft was then broken up, and the crown of the arching over it appeared at only 6 in. below the surface. The shaft was about 100 yds. from the house, was 140 ft. deep and over 4 ft. wide, and ended in a chamber cut in the chalk, which was about 30 ft. by 50 ft., and 9 ft. high. The roof was flat, its position being determined by the existence of a band of flint, and the chamber was supported by three pillars of chalk in its centre. The shaft was carefully lined as far as the chalk, the upper 75 ft. being lined almost entirely with bricks, below which 40 ft. were lined mainly with blocks of chalk, and the lowest 22 ft., being in the chalk, were unlined. But there were six courses of chalk in the brickwork, and eight courses of brick in the chalk.

At some date much later than that of the original construction of the shaft and chamber a drain had been made leading to the shaft, and the chamber below had been used as a cess-pool. From the quantity of deposit at the bottom of the chamber, Mr. Petrie thinks that the drain probably ran into it for at least a century, perhaps two or three centuries. As regards the age of the shaft and chamber, the bricks in the shaft do not, in his opinion, offer any conclusive evidence, and he is equally doubtful as regards the objects of the makers of the shaft and chambers. However, it seems clear that they could hardly have been the mere extraction of chalk. Consequently, it seems to me that as this Eltham pit must have been made for the sake of the chamber excavated, and not for that of the material extracted, it belongs to the denehole class.

The strata above the chalk in the denehole shafts of Cavey Spring, Stankey, or Hangman's Wood consist of Thanet Sand with an occasional capping of gravel at the surface. At Eltham the following section, which is that of a well at Eltham Park, a few yards southward of the denehole, is given by Mr. W. Whitaker (*The Geology of London and of Part of the Thames Valley*, ii. 71).

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		ft.	in.
Oldhaven or Blackheath Beds.	Ferruginous quartzose sand [? with pebbles in the lower part]	44	—
Woolwich Beds	Yellow mottled clay with white fragments of shells	6	—
	Green sand	10	—
	Black pebble-bed	10	—
Thanet Sand, nearly white Chalk		52	—

While the Thanet Sand stands so well that the foot-holes in the sides of the shafts at Hangman's Wood are still visible, the variable nature of the strata overlying this sand at Eltham would alone necessitate the steining or lining of the shaft there to ensure stability. In addition, a difficulty arises from the fact that the 6 ft. of yellow mottled clay at the top of the Woolwich Beds would hold up the water percolating through the sand and gravel of the Oldhaven Beds at the surface, and cause its concentration towards the base of those beds. This would make necessary a specially well-made and watertight lining for the shaft from the surface to a few feet below the top of the Woolwich Beds, and is, no doubt, the reason why, at Eltham, the shaft was lined with bricks only down to a depth of about 50 ft., the alternating courses of brick and chalk beginning below that depth.

The Eltham denehole was discovered towards the end of January, 1878. On 12 April, 1878, after a night of extremely heavy rain, it was found that at a spot on Blackheath, south of the Shooters Hill Road and west of that between the south-eastern corner of Greenwich Park and Blackheath Village, the earth had sunk in to a depth of about 20 ft., leaving a nearly circular hole 7 ft. to 8 ft. in diameter. Its sides were vertical except near the bottom, where they gradually expanded, so that, at the lowest point visible, the diameter of the hole was about 14 ft. After some little delay this hole was filled up by the Metropolitan Board of Works. But early in November, 1880, a second subsidence took place on Blackheath more than 600 yds. south-west of the first; and later in the same month a third hole about 110 yds. south-east of that which appeared in 1878. The hole of 1878 and that south-east of it were almost identical in size and shape. But that to the south-west, near Eliot Place, was much less deep than the other two, and expanded much more at the bottom. Its shape suggested that the subterranean hole, filled up as the result of the subsidence at the surface, might be much less deep than in the two other cases. The positions of all three are now marked by metal plates fixed on the ground.

The Lewisham and Blackheath Scientific Association formed a committee, early in the year 1881, for the purpose of making an exploration of the more recent and more easterly of the two deeper holes. Prof. J. K. Lughton, then at the Royal Naval College, Greenwich, being chairman of the Committee, which began work on 4 April, 1881. The beds between the surface of Blackheath and the chalk are, apart from slight variations in their respective thicknesses, identical with those at Eltham Park; the depth of the chalk at Blackheath being probably 15 or 20 ft. less. The Oldhaven (or Blackheath) pebble beds in which the workmen began to dig were throughout broken and disturbed, and yielded readily to the spade. At a depth of 34 ft. from the surface water began to appear, and as the depth increased became more and more troublesome. When speaking of the steining of the Eltham shaft, I mentioned the concentration of water towards the base of the Oldhaven Beds owing to the presence beneath them of the clayey beds of the Woolwich series. But in the case of a small shaft in unbroken ground the water difficulty would be trifling compared with that encountered in a very large shaft in loose and shattered ground, like that of the Blackheath pit. For there the earth behind the timber framework had no cohesion, and it speedily became apparent that the timber ¹ might prove to be of insufficient strength. At a depth of 43 ft. the earth on the south side of the hole became markedly hard, that on the north side remaining soft and broken. This caused the framework to cant, and its shape to alter till, from being a rectangle, it became a rhomboid or diamond. This alteration in shape increasing, the Committee determined, on account of the great expense which would have attended a continuation of the digging, to drive a tube vertically down, to test the hardness or softness of the earth, and to ascertain if any cavity existed underneath. Accordingly, an iron gaspipe of 1½ in. diameter, having a loose steel-pointed plug at the lower end, was driven down, with some difficulty, to the depth of 70 ft., the ground through which it passed being hard. Thence to the depth of 82 ft. the pipe was driven with very great ease. Owing, however, to a frac-

¹ This timber framework was introduced into the pit to ensure safety when digging.

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ture of this pipe, it was withdrawn and another substituted. This was driven down to the depth of 84 ft. 6 in., when the point was stopped by some hard mass which could not be penetrated, and the pipe had to be withdrawn, a task which was effected only with the greatest difficulty, though the first pipe had been withdrawn with ease, and the second had been driven down, as nearly as possible, in the track of the first. Then, as the money spent had somewhat exceeded the amount subscribed, it was resolved to withdraw as much of the timber as might be practicable, and to fill up the hole.

The Exploration Committee, as a whole, were not able to accept any view as to the causes of this subsidence as conclusive. The present writer, who was a member of the Committee, was permitted, however, to append to the Report some observations pointing out that the clayey beds of the Woolwich series (which were the source of the main difficulty during the exploration), by concentrating the water falling as rain on the surface of Blackheath towards the base of the pebble beds, would prevent it from acting on the chalk beneath. This fact would consequently make any explanation of the subsidence as the result of the natural action of water on the chalk untenable. But that, granting the existence of a shaft ending in a chamber in the chalk, under Blackheath, similar to that at Eltham Park, the result of the action of the water at the base of the Blackheath Pebble Beds on a neglected and disused shaft would be to cause an enlargement there which would ultimately produce a subsidence resulting in a hole at the surface such as had appeared (see figs. *A, B, C*, fig. 10). And (to quote the Report) 'Professor Prestwich pronounces, with confidence, that so far as he can judge, the cause of the subsidence is not geological: Mr. Whitaker leans to the same opinion.'¹

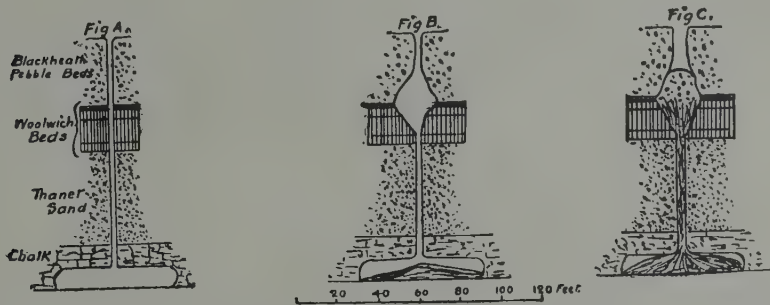


FIG. 10. DIAGRAM SECTIONS SHOWING NECESSARY RESULTS OF LONG DISUSE ON A SHAFT AND CHAMBER AT BLACKHEATH.

During the present year (1906) a tunnel, in connexion with the Main Drainage works of the London County Council, has been in process of formation in the chalk under Blackheath, and shafts have been sunk at intervals along its course. I noticed that two of these shafts, one north of the road from the south-western corner of Greenwich Park to Morden College, the other on the southern side of the Shooters Hill Road, were in a line with the subsidence which appeared at the surface on 12 April, 1878. Much interesting information was kindly given me by Mr. B. C. Cass, a member of the firm of Messrs. S. Pearson and Sons, the contractors, about the workings under Blackheath. I learned from him that the water found at the base of the pebble beds forming the surface caused no serious difficulty when the shafts were being sunk; and that, under the spot at which the above-mentioned subsidence occurred, the chalk, at a depth of about 120 ft. from the surface, was found to be broken up and mixed with soil and other material from beds nearer the surface. Though this discovery is evidently important as indicating at this spot a special artificial connexion between the chalk and the surface, it seems at first somewhat disappointing to hear only of a confusion of rocks where a distinct chamber in the chalk, like that at Eltham, might be expected. But it must be remembered that the Eltham shaft and chamber were accidentally discovered after they had

¹ Thus I may claim that the best geological authorities were against a merely geological explanation, and so far, at least, in favour of my view. On the other hand, up to 1881, deneholes had been ignored by everybody but Mr. Spurrell. I feel accordingly that it would not be justifiable, in an account of the deneholes of Kent, to omit the subsidences at Blackheath, and their probable origin.

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been kept in repair and utilized down to a comparatively modern period; while at Blackheath the positions of old shafts, with presumably chambers at their bases, have hitherto been revealed only when the falling in of the long disused and neglected shafts, through the action of the water concentrated at the base of the Blackheath pebble beds, has at once both choked up shaft and chamber, and at the same time indicated their position by the subsidence at the surface resulting from their destruction.

Before leaving Blackheath it seems to be worth mentioning that Mr. Spurrell alludes to, but does not quote, the following account of a subsidence at Blackheath in 1798. It appears in the *Gentleman's Magazine* for 1798, p. 1,078: 'A singular accident happened last week at Blackheath. As a farmer and his son were conversing together in a field where a horse was feeding, on a sudden the animal sunk into the earth (hind feet first) to the depth of 15 ft., out of which he was dug, crushed to death. The cavity was only just sufficient to admit his body, the surrounding soil remaining firm.' This account certainly suggests a subsidence similar to the two deeper ones on Blackheath. But it seems to have taken place in some field near the open common known by that name, not on the common itself.

Much careful exploration will be necessary before any definite knowledge can be obtained as to the comparative antiquity of deneholes, and the periods not only of their construction but also of their utilization. We have seen that the pair of shallow deneholes near Crayford, described by Mr. Spurrell, dated from the Neolithic period. Then the exploration of the deneholes of Hangman's Wood by the Essex Field Club in 1884 and 1887 made it probable that they originated in post-Neolithic but pre-Roman times, and were in use throughout the Roman occupation and possibly later. On the other hand, the remark of the young labourer's father at Billericay in 1871 that an excavation like a gravel-pit was 'a denehole which had caved in,' decidedly suggests that, in some form, they must have been made and used, in districts where they had once been in demand, down to a comparatively recent period. Probably the circumstance that they were secret storehouses, etc., tended to a reticence as to their existence on the part of the agricultural population using them, which may explain the absence of any modern antiquarian allusions to them as not only once used, but as still found useful locally.¹

APPENDIX II

ON THE EMBANKMENTS OF THE THAMES IN KENT

The embankments of the Thames below London as seen in their entirety present an appearance of completeness which somewhat exaggerates their importance. They are the result of the slow and creeping work of centuries. When the country was occupied by the Romans the low lands of the Thames were dry, that is not invaded with salt water. The river was fresh and very shallow, with meandering streams from the uplands adjacent. Large trees hundreds of years old, of such kinds as we have now growing, covered the bottoms and spread over the area of the present marshland, and everywhere are found Roman remains, pottery, and flint and chalk used in building. This level, which is a little below the Ordnance datum, may be called the Roman level. It is scarcely probable that any banks were needed here and none have been found of the Roman period; nor can there be found any places indicating the least connexion between a Roman site and an embankment of any date. At the termination of the Roman period or soon after there came an irruption of the sea, which overthrew the trees and buildings and deposited over all grey tidal clay with salt water shells. The river became an estuary and has remained so ever since. The invasion of the sea was sudden, probably in the nature of a catastrophe, and accomplished the destruction of extensive settlements on the low shores and numerous islands eastward of the Medway mouth. This change was probably caused by a small subsidence of the land accompanied by so-called tidal waves. There are no banks for keeping out the tide known to be of Saxon date, except those of Littlebrook and Sittingbourne, and these were hythes of small size placed to haul up ships in winter and guard off storm floods and foes. To two of these can be assigned something of a date, viz., Littlebrook, which is mentioned as a celebrated place in a charter of

¹ As it has been suggested that the caves at Chislehurst are of the nature of deneholes, it may be well to mention that there can be little doubt that they are workings in the side of the hill for chalk, and are probably of a comparatively late date.

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Ethelred, A.D. 995. It was also one of the two ports of Dartford. The Sittingbourne hythe was apparently thrown up by Hasten in 893, and at the shoreworks at Lesnes is a similar hythe. There are other places which point to a similar use and period. Many enclosures are the result of the enterprise of the Religious houses situated on the adjacent hard shores in the neighbourhood of causeways and ferries. About the year 1000 what had been already done in reclaiming land was intermitted and abandoned to the sea.

The effective embankments in the estuary of the Thames, as we see them to-day, and which hedge in the river, are of no great antiquity. They are the result of piecemeal enclosures which have advanced side by side at right angles (so to speak) to the course of the stream from either shore, until a line was reached where the shore banks could be abandoned and their builders unite their labours in forming two long ones parallel to the current. This has been a long process, and weak places, great storms and inattention on the part of some of the riparian owners have been the frequent cause of their destruction, and required careful watching and repeated mending. In the earlier part of their existence the walls were thrown up to win the land from the water, and it was not until the union of the parallel walls had been nearly or quite completed, that it was perceived that a much more important thing to the country at large had occurred, viz., the deepening and straightening of the common waterway. For as the parallel banks approached each other the tidal currents ran more swiftly and the scour increased, so that the waterway was shortened and larger ships could travel further inland. Then too it was found that this was not a matter which could be left to small owners who were careless and narrow-minded, but was a matter for State interference.

In the twelfth century the monks of Barking and Stratford enclosed much marsh, but the pieces cannot be identified. Lesnes Abbey is not recorded to have received enclosed marshland on its foundation in 1179 A.D. The monks however enclosed a part of their marsh in 1279 A.D. and the rest within the next twelve years after. These are early dated examples. That of Lesnes is peculiarly interesting, as we can identify one or more of the banks then thrown across the marshes. The plan here followed to obtain the end in view was simple and bolder than most of those pursued on the Thames. A much more cautious method was the commoner, which consisted of running out a small bank from the shore a few yards and returning to the shore again, then from some point on that line other essays were made until a large area was enclosed. Not unfrequently the earlier banks were cleared away for material to be used up again. In some old deeds this was expressly prohibited. A row of old manor ways which have long been superseded when ending in a line may be seen to indicate the termination of the fresh marsh. Some of these ways are still called walls, though now levelled. Of such are the 'Farthing,' 'Ham,' and 'Meads' walls at Cliffe. Not much enclosure is practised now, but the end of the last century saw some extensive efforts at re-embanking at Slayhill and Milford Hope. But with the wash of the sea consequent on the destruction of some islands which acted as breakwaters, little good can now come of such labours so far down.¹

¹ For maps and sections of marshland works, *Arch. Journ.* xlii. 269, and *Proc. Geologists' Ass.* xl. 210.

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THE cultivation of the soil appears from early times to have been in a more advanced state in Kent than in other parts of Britain, and Caesar himself describes the people as having plenty of cattle and as being more civilised than those elsewhere in the country. This relatively advanced condition was probably due to the proximity of the county to the Continent, and to this fact may also be attributed much of the spirit of enterprise and innovation which has in a special degree been characteristic of the husbandry of Kent. It is to Flemish refugees in the sixteenth century that Kent owes the introduction of technical methods of hop-cultivation, although the plant had been grown to some extent in England for a hundred years or more. These peaceful invaders from the Low Countries also brought with them new or improved varieties of fruit and vegetables and introduced the system of 'petite culture' which is still so marked a feature of the region from which they came. To this day hop-plantations, however large, are spoken of as 'gardens,' a reminder of the conditions under which their cultivation was originally carried on. The Continental features in Kent farming long survived as an integral part of the system more particularly of the eastern part of the county, and it is only in comparatively recent years that they have languished, and in some instances almost disappeared.

Towards the end of the eighteenth century Boys wrote his report on the Agriculture of Kent for the old Board of Agriculture, and Marshall, about the same time, included in his *Rural Economy of the Southern Counties* some observations on particular parts of the county. Canary-seed, radish-seed, turnips and colewort, as well as hops, were found on almost every farm having a soil adapted for them. Of ordinary crops on arable land the principal were wheat, beans, barley, oats and peas. Wheat was estimated to yield about twenty-two bushels per acre, and was one of the chief agricultural exports of the county, being despatched to London from Maidstone and the coast-towns in hoys carrying from three to five hundred quarters, which returned with groceries for the supply of the county. Hops were sent away by the same means, the streets and quays of Maidstone presenting an extraordinary scene during the height of the season. Cultivation was mainly arable, and both butter and cheese had to be imported. The fertile alluvial soils round Faversham, Sandwich and Deal produced good crops of wheat, beans and canary-seed, and were under excellent management. The western part of the county was much more inclosed than the eastern, and produced more timber and underwood, the best cultivated land being on the north from Rainham to Dartford. The Chalk belt running through the middle of the county from east to west was esteemed of little value owing to the great expense of cultivation. The Greensand and Gault or 'Ragstone' soils bordering the chalk on the south produced great quantities of hops and fruit in the centre of the county, with poorer soils and much waste land in the west. The Weald was more thinly inhabited and less cultivated than other parts of the county, though its ancient forests, formerly the haunts of deer and hogs, were for the most part cleared.

The Kentish turn-wrest plough was in use all over the county. Marshall speaks of it as an enormous implement, to describe which verbally were impossible, and he goes on to condemn its use on the level free-working lands of East Kent as a species of idolatry which nothing but blind bigotry would tolerate. It was an exceedingly heavy wooden implement with two large wheels 'more like a cart than a plough,' and all the furrows were turned one way by means of a shifting mould-board. In East Kent four horses could plough an acre and a half in a day; in the west, owing to the greater tenacity of the soil, seldom more than an acre was ploughed in a day, even with six horses. Boys, however, claimed for this plough that, for all sorts of soil and all required depths, it was the best he had ever tried, and it is a remarkable fact that, although lighter ploughs have been introduced, the old implement, with but

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few modifications, is still widely used in Mid-Kent and the Weald, with three horses, however, or at most four on the heavy soils.

In the succession of crops there was, as at the present day, a marked absence of any settled practice in the county generally. On the rich soils near Faversham, Sandwich and Deal (1) barley or oats, (2) beans or peas, (3) wheat was the course followed. Sometimes a crop of canary-seed was sown on the bean-stubble. In Sheppey beans and wheat were taken alternately, and once in six or eight years a summer fallow took the place of beans in order to clean the land. In Thanet a four-course system, but with great variations, was followed—(1) fallow, (2) barley, (3) clover, (4) wheat, and on the deep rich loams, beans followed by wheat and then barley, Thanet barley being celebrated throughout the country. Sainfoin was much grown on the Chalk lands. It was sown with Lent corn, and with good management would yield as much as sixty cwt. of hay to the acre and last for ten or twelve years. Summer fallowing was common. In the Weald, tenants were bound to lay a hundred bushels of lime per acre on the wheat fallows.

Draught animals were brought from the Midlands while young. In Thanet and East Kent some were bred, while Flemish and half-bred Flemish horses were also found there. Sheppey horses were bred from a native stock long established in that island.

Sheep were bred on the uplands of East Kent and fattened on the marsh-pastures. Hardly any sheep were bred in the Weald, but many were indifferently wintered there. The mainstay of the Weald farmers was the fattening of cattle, which were disposed of from March to June. Many Welsh cattle were fattened also on the marsh-lands of East Kent.

Landed property at this time was very much divided, and the number of yeomen was considered to be increasing. Few farms on the richer soils exceeded two hundred acres, though on poorer lands they were frequently very much larger. The average rent in 1796 was put at 15s. an acre with a range of 5s. up to 30s., and for choice land as much as £5 an acre.

The older farm servants received 10s. to 10s. 6d. per week without, or £8 to £13 a year with board; younger hands, from £3 a year upwards; dairymaids, £4 to £5 a year; women-weeders 8d. to 10d., and children 6d. a day. Harvestmen earned £3 10s. to £4, with board, for five weeks' work. These rates were said to be nearly double those obtained thirty years previously.

About fifty years later, in 1845, Buckland's report on Kent Agriculture appeared in the *Royal Agricultural Society's Journal*. In the interval a great deal had been done to advance the state of husbandry by draining, by clearing away useless hedges, by deep culture, by the extended use of fallow crops, and other improved methods, and the heavier crops obtained from the soil testified to the general progress made.¹ Rents had risen considerably, ranging from 6s. on the inferior Chalk soils to 50s. on the lands north of Canterbury, and even 60s. per acre or more on the best pastures of Romney Marsh. Much waste land had been inclosed and the cultivation of root and green crops enabled an increased number of cattle and sheep to be reared and fattened. Improved Kent sheep were coming into favour in various parts of the county. Market-gardening of an intensive character was increasingly carried on near London, and it was no uncommon thing for gardeners to lay on 100 or 120 tons of manure per acre. Cattle were grazed in the Greenwich, Woolwich, Plumstead and Erith marshes, and Shorthorn cows were kept for the supply of milk to the metropolis.

During the last thirty years Kent has, in common with other parts of the country, suffered much from the great fall that has taken place in the price of many kinds of agricultural produce. The districts that have felt the depression most keenly have been the heavy wheat and bean lands, thousands of acres of which have been laid down, or have tumbled down, to pasture. The characteristic changes which have occurred are concisely indicated in the following

¹ Official returns of the produce of crops are only available since 1885. The yields per acre in Kent during the past two decades have been as follows:—

	1887-96.	1897-1906.		1887-96.	1897-1906.
Wheat (bushels)	31·75	34·54	Potatoes (tons)	5·68	6·28
Barley "	36·61	38·38	Turnips and Swedes	12·91	12·39
Oats "	47·25	47·20	Mangold	18·25	19·31
Beans "	27·09	30·27	Hay from Clover and		
Peas "	26·98	30·94	Rotation Grasses	1·37	1·37
			Hay from Permanent		
			Pasture	1·05	1·04

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table showing at intervals of ten years the area under the principal crops and the number of live stock officially returned in the county since 1867 :—

A. AREA UNDER CROPS

Crops.	1867.	1877.	1887.	1897. ¹	1906.
	Acres.	Acres.	Acres.	Acres.	Acres.
Wheat	105,598	98,697	70,343	47,427	41,978
Barley	40,477	43,018	47,618	39,502	33,193
Oats	54,167	54,509	47,771	47,738	46,591
Rye	616	608	1,493	1,256	938
Beans	23,650	17,820	13,555	7,463	7,518
Peas	19,447	20,864	19,754	14,272	11,624
Total Corn	243,955	235,516	200,534	157,658	141,842
Potatoes	9,502	13,576	15,870	13,067	14,512
Turnips and Swedes	33,297	27,095	24,781	21,582	17,059
Mangold	8,294	12,113	11,811	10,856	12,273
Clover and Rotation Grasses	55,770	59,849	57,134	52,488	36,466
Hops	40,762	45,984	40,037	31,661	29,296
Small Fruit	—	—	[12,344] ²	22,080	22,146
Other Crops	26,372	31,030	32,561	27,050	31,045
Bare Fallow	13,908	10,178	8,913	10,902	7,249
Total Arable Land	431,860	435,341	391,641	347,344	311,888
Permanent Pasture	288,280	302,722	358,273	402,028	429,166
Total Cultivated Land	720,140	738,063	749,914	749,372	741,054

B. NUMBER OF LIVE STOCK

	1867.	1877.	1887.	1897.	1906.
	No.	No.	No.	No.	No.
Horses	—	29,616	28,041	27,641	27,679
Cows and Heifers	24,500	26,355	31,985	32,945	39,144
Total Cattle	68,137	64,597	75,222	76,447	93,251
Sheep	1,063,414	971,098	943,418	934,698	910,368
Pigs	75,570	64,654	54,678	57,135	60,979

NOTE.—The above figures apply to the stock kept in the county in the summer time. From the prevailing practice of the county it may be assumed that a winter census would show more cattle and fewer sheep.

It will be seen that in 1867 arable land occupied three-fifths, and in 1907 only two-fifths of the cultivated surface, the decline being heaviest in wheat, beans, peas, clover and turnips. The grass area shows a corresponding extension.

As regards live stock the chief features to be noticed are the large increase in cattle, especially cows, indicating possibly an extension of dairying, and the steady decline in the number of sheep, of which, however, Kent still maintains a larger number per acre than any other English county. None of the foregoing changes have been peculiar to Kent, which has only shared, in some cases to a greater, in others to a lesser degree in movements which have been general throughout the country.

But in one feature of its agriculture the experience of Kent during the last eleven years presents a striking contrast to that of nearly every other part of the country, for while there has been a distinct tendency in England for medium-sized holdings to increase in number

¹ In the formation of the County of London in 1893, 19,570 acres were taken from the area of Kent.

² In 1888.

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at the expense of both small and large holdings, in Kent there has been a considerable increase in the number of small farms.¹ In many parts of the county, as for example in Sheppey, the movement has probably been more in line with general experience, as arable farms have gradually become merged in extensive grazing tracts. It is in the rapid increase of fruit and vegetable culture in the more favourably-situated parts of the county that an explanation of the growth of small holdings in Kent must in all likelihood be sought.

While the number of persons directly interested in the cultivation of the soil has thus increased, there has been in Kent, as in every other county, a great reduction in the number of agricultural labourers employed. Of males there were 47,000 in 1861, 40,000 in 1881, and only 31,000 in 1901. Not only has the decline in arable cultivation lessened the demand for labour, but on the smaller area of ploughed land far less labour is now required owing to the ever-increasing use of machinery, notably the self-binding reaper. Apart from those in regular employment a great number of temporary labourers are required at certain seasons of the year, particularly for fruit and hop-picking. In all probability the numbers engaged in the hop-gardens have diminished, while fruit picking gives more employment than formerly.

The proximity of the great commercial centre offers great attractions to the younger farm labourers, and causes the general rate of wages to be relatively high in Kent. The weekly earnings of an ordinary labourer in 1902, including the value of allowances in kind, were estimated at 19s. 7d., and the cash wages alone at 16s. 4d. throughout the year. Men in charge of animals would obtain 6d. to 1s. 6d. more than these amounts.

Some account of the existing state of agriculture in various parts of Kent, and of some of the special features of its agriculture, will now be given. In a recent article by Sir Charles Whitehead² the county was divided into four large districts, viz. East Kent, North Kent, Mid-Kent and the Weald, and four smaller areas, viz. Thanet, Sheppey, The Hundred of Hoo, and Romney Marsh. The same divisions will accordingly be adopted here.

EAST KENT.—This is the largest of the divisions to be described, occupying about three-eighths of the total area of the county. It is bounded roughly by a line drawn from Rochester to Ashford and thence to Hythe.

The proportions of arable and pasture land in this part of Kent are about equal, and taken altogether it is the most important part of the county for the growing of corn; of barley in particular, 60 per cent. of the county acreage is found here, while wheat and oats are each grown upon practically the same extent of land, viz. some 20,000 acres. Roots (principally turnips) and rotation grasses come next in importance, occupying about equal areas.

The greater part of the division is on the Chalk, which here attains its greatest breadth, extending from Folkestone to within four miles of the north coast. Much of the land consists merely of a more or less shallow covering of mould upon the Chalk, in some districts loamy and friable but in others marly and unkind. These features characterize the soil from Canterbury to Deal, Dover, Folkestone and Ashford as well as the slopes of the chalk hills westward to Rochester. The rotation followed in these districts is usually the four-course—(1) wheat, (2) turnips, (3) barley, and (4) grass. On the better soils a seven-year course is taken, such as (1) turnips, (2) barley or oats, (3) seeds, (4) wheat, (5) barley or oats, (6) peas or beans. This is varied by sowing sainfoin with barley and oats or by sowing Italian rye-grass and white clover and leaving it down for two or three years.

In the north-east there is some useful alluvial soil formed by the gradual silting up of the Stour, and extending as far south as Deal. It affords valuable pasture land which is worked in conjunction with the arable farms on either side of the Stour. It will fatten 1½ bullocks per acre and will carry 2½ sheep per acre during the winter. There is also some good pasture land in the south on the Gault belt fringing the Chalk between Folkestone and Ashford. Con-

¹ The comparison between Kent and the rest of England is as follows :—

	Kent.		Rest of England.	
	Number in 1895.	Number in 1906.	Number in 1895.	Number in 1906.
1. Small Holdings—				
Above 1 and not exceeding 5 acres	2,156	2,212	84,899	78,705
Above 5 and not exceeding 50 acres	4,670	5,017	165,921	161,000
2. Medium-sized Holdings—				
Above 50 and not exceeding 300 acres	3,165	3,382	103,790	106,354
3. Large Holdings—				
Above 300 acres	494	431	15,084	14,280

² 'A Sketch of the Agriculture of Kent' in *Journ. of the Royal Agric. Soc.* (1899).

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sequently the numbers both of cattle and sheep maintained, but particularly of sheep, are large (for East Kent as a whole the summer census gives about fourteen sheep to every ten acres). Many farmers buy Kent lambs at the large fairs at Romney and Ashford in the early autumn, and fatten out on cake or corn those that they do not require for breeding; some of them have grazing land in Romney Marsh. Cattle are not extensively bred. A few Irish beasts are fattened, but Welsh cattle, which used to be fattened in the district, are not now seen. Generally speaking there is not much fruit land in this part of the division and only a moderate amount of hops.

The best land in East Kent is in the north, extending on either side of the railway from Chatham to Canterbury. It consists of rich deep loams on the London Clay and Oldhaven and Woolwich Beds. No regular rotation is followed, but good crops of grain and potatoes are grown. The barley is of superior quality and is much sought after by brewers, while wheat in Canterbury has of recent years made a higher price than at almost any other market in England and Wales. Large quantities of fruit are grown, greengages and cherries flourishing particularly well. It was at Teynham, in the heart of this region, that the improvements in fruit cultivation in Kent commenced more than three centuries ago. Lambard (writing in 1576) described the country from Rainham to Blean Wood, near Canterbury, as 'the cherry-garden and apple-orchard of Kent.' The district still maintains its reputation and the extent of fruit land is being continually added to. Very great improvement has taken place in the management of cherry orchards. Formerly they were mown, but the practice has long been considered injurious and is now abandoned. It is also believed that to allow grass round the trees is prejudicial to fruit-bearing, and that it is exhausting to the orchards to feed animals in them unless the latter are at the same time liberally supplied with cake or corn.

The finest hops in the county and, as some hold, finer than anywhere else in the world, are grown in this area. Not many cattle are fattened, but large flocks of sheep are kept. The general style of farming is better than in almost any other part of the county. This is no modern characteristic, for it was observed by Arthur Young a hundred and twenty years ago that the so-called excellent husbandry of Kent must be understood as applying only to a limited area in the north of the county.

East Kent is somewhat subject to cold winds in the spring which at times, especially when accompanied by rain, do much damage to the young crops and the fruit blossom.

NORTH KENT.—The North Kent division is marked off approximately by a line drawn from Chatham to Cudham, near the Surrey border, and not including the peninsula of Hoo. Its northern part is principally on the Woolwich, Reading and Oldhaven Beds and the London Clay, giving as a rule a good class of soil. Further south where the chalk is only covered by its natural thin layer of soil much of the land is poor, cold and unkindly. On the shores of the Thames and in the valley of the Darent there is some good alluvium. As in other parts of Kent there is no regular rotation of crops, those being taken which will pay best at the time. The farming is principally arable. Oats is the most widely cultivated corn crop, but both wheat and barley are largely grown. There is also a very large area under potatoes, about half the total acreage in the county being in this division. These, with other vegetables, are extensively raised on the clay lands. In the cultivation of fruit this district occupies a remarkable position, for it contains nearly as large an area of 'small' fruit as is grown in all other parts of the county put together, and this item occupies a larger area than any ordinary farm crop in the district. Fruit has been planted during the last thirty years in most parts where the soil is suitable, but particularly in the valley of the Cray, where great crops of strawberries are raised. Large quantities of raspberries, gooseberries and currants are also grown.

A remarkable development in the use of glass has occurred in recent years in the Abbey Wood district above Erith Marsh. A succession of artificially raised strawberries with a first crop in January—occasionally ready for Christmas dessert—tomatoes, and finally chrysanthemums and asters, are produced under frames two or three hundred feet in length. The respective plants are brought as forward as possible in the open, and are removed from the houses as soon as they have ceased to be profitable. When in bloom the great length of plants forms a pleasing and interesting picture. The gleaned strawberries—successors to those sold at the 'guinea' rate—become the ripe fruit which, in the hands of street vendors, sometimes astonishes a Londoner long before a naturally-grown berry has turned colour.

Of orchard land the extent, though very considerable, is less marked than that of small fruit, and hops are not much grown except in the east towards Rochester and Chatham. The proximity of London is a great advantage to this district, which possesses ample facilities for obtaining the requisite manure and for the transport of its produce.

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Dairying is engaged in near London, otherwise not many cattle are bred or kept in North Kent, and on the whole the number of sheep is smaller in proportion than in other parts of the county. The flocks increase towards the eastern part of the division, and in the same direction the size of the farms also increases in a marked degree.

MID-KENT.—This division lies between the one last described and the Weald. Its eastern boundary is East Kent and its western the county of Surrey. Across it in succession from north to south run the Chalk, Gault, Lower Greensand and Weald Clay formations, the greater part being on the Greensand. The soils on this formation vary in quality, being generally sandy and poor in the west, but of finer quality towards the east of the division, notably near Maidstone. Along the sides of the hills, overlooking the Weald, is found a narrow belt of soil provincially called 'Coomb,' which, though very heavy in texture, is extremely productive and suitable for filberts and fruit. The Chalk soils in the north are of little depth and only moderate fertility. In the south a good deal of the stiff Weald Clay land is improved by admixture with the Greensand loams. There is no regular rotation of cropping. A century ago wheat and beans occupied the principal place, and on some of the best land in the Maidstone district sometimes alternated with one another for years without a break. Very few beans are now grown, but wheat is still cultivated to a fair extent except in the west. The principal grain crop, however, is oats. There is a comparatively small extent of barley, this crop not yielding first-rate samples for malting. Roots and potatoes are extensively grown. A large proportion of the land in the extreme west is under grass with a not very considerable amount of hops and fruit. In the remainder of the division, but particularly in its centre, a great amount of land is devoted to these two kinds of produce, and, except on the Chalk soils, the fruit area is being continually added to. On the slopes of the hills below Maidstone the blossom presents a wonderful sight in the springtime, the trees stretching away east and west as far as the eye can reach.

A great amount of manure is required for the hop lands. Formerly almost every farmer tied up bullocks for this purpose, buying Sussex animals from breeders in the Weald. Now it is cheaper to get stable manure by rail and river, consequently but few bullocks are fattened, though Sussex and Shorthorn cattle are somewhat extensively bred. There are ample facilities for the conveyance of produce and of farmers' requirements by rail and river. The Medway is tidal as far as Maidstone and a canal runs thence to Tonbridge.

THE WEALD.—This division lies south of Mid-Kent below the line of railway from Guildford to Ashford and is bounded on the east by Romney Marsh. The upper parts are principally on the Weald Clay with soils of stiff yellowish clay except in a few places where they are overlain by loams and gravels. Towards the Sussex border the Hastings beds occur, and here the soil is of a lighter texture with admixture of sand and occasional patches of loam. The clay lands are susceptible of great improvement, but being essentially wheat and bean soils they have keenly felt the depression in prices, and though both these crops are still largely grown they occupy a subsidiary position. Barley is scarcely grown. The principal corn crop is oats; on the better lands it sometimes follows wheat and then the land is sown down to grass for several years. Arable farming altogether is of much less importance than in any other part of the county except Romney Marsh and Sheppey, about three-fourths of the cultivated area being under grass. In some parts of the district, notably near Goudhurst and Breckley, the soil is well adapted for hop-growing, and the Weald contains about one-third of the whole acreage under this crop in Kent, most farms having a few acres of hop land.

Apple trees thrive well in most parts of the Weald. The extent of land under orchards is large, but small fruit is little grown.

Large numbers of cattle and sheep are kept; the Sussex breed of cattle is found on most farms and some are bred in the division. During the summer the majority of the sheep are grazed in the eastern or lower parts. Many lambs are taken in from Romney Marsh for the winter, and Kent sheep are bred on the larger holdings. As a rule farms in the Weald are smaller than in other parts of the county. The fields too are small and hedgerows numerous.

THANET.—The Isle of Thanet, in the extreme north-east of the county, contains an area of about 29,000 acres, and is divided from the mainland by the Stour and its northern branch the Wantsum. The latter, from being a considerable stream, has dwindled to insignificance, and on either side along its course there is now an alluvial soil affording valuable marsh pastures. In the higher part of the island there is an outcrop of the Chalk. Some of the uppermost land is rather thinly soiled, but on the whole it is described by Marshall in his *Rural Economy*

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of the Southern Counties as 'the best soiled plot of chalk hill this country possesses,' and contemporary writers on husbandry spoke of the island as 'one of the finest gardens in the kingdom.' Though the natural fertility of the soil may be inconsiderable it has for centuries been maintained at a high standard by copious manuring, the seaweed left in large quantities by the tide being much used for the purpose. This systematic improvement of the soil originated with the religious fraternities which at one time held a considerable portion of the island, and were the pioneers of good husbandry.

The area under cultivation at the present time is 22,000 acres, of which precisely two-thirds are arable. Generally speaking there is no special rotation. Barley is the staple crop, being grown on upwards of 3,000 acres. The grain is heavy in yield and of the finest quality. Frequently two barley crops are taken in succession. Oats and wheat are largely grown, as also are roots, potatoes and peas. Lucerne, a valuable fodder crop the cultivation of which in England is mainly confined to the south-eastern counties, is grown on a considerable area in Thanet. It has been cultivated as a field crop in this country for about 150 years. It thrives well on calcareous soils, is a deep-rooting plant, and for the maximum yield requires dryness and warmth.

Canary-seed was at one time cultivated for domestic use and export. It was sown broadcast on land previously laid up in furrows 11 to 12 inches apart. The crop came late to harvest and yielded about four quarters to the acre, the offal making excellent horse-fodder. Its cultivation, as well as that of caraway and coriander seed, has now almost ceased, but a few other kinds, such as radish and flower seeds, are still grown. Hops of fine quality are grown in the parishes of Monkton and Minster. There is also a fair amount of fruit in the sheltered parts round Minster and towards Ramsgate, but not elsewhere. As regards live stock there are in June about 1,000 horses, 3,000 cattle, 17,000 sheep and 3,000 pigs. The majority of the cattle are cows and heifers, large dairies being found in the vicinity of the various watering-places, near which also market-gardening is somewhat extensively carried on. The holdings in Thanet are generally small. Of those above one acre the average size is 60 acres, and three-fourths of the total number do not exceed 50 acres in extent.

SHEPPEY.—Sheppey is an island of about 22,000 acres, or three-quarters the size of Thanet, and is separated from the mainland by the Swale. From ancient times it has been renowned for its sheep and wool, deriving, in fact, from these products its name of 'Scaepige' or 'Ovinia.' The soil is principally strong clay and stiff loam of the London clay, generally very heavy to work, but in the south and west there is some alluvial soil affording good marsh pasture.

Sixty years ago Buckland described the cropping as usually six-course: (1) Summer fallow, with dung, chalk, or lime; (2) beans; (3) wheat; (4) beans and clover; (5) wheat; (6) oats. In some cases the bare fallow was superseded by tares, potatoes, mangolds, carrots, etc., but turnips were not generally grown. At the present time the course of some farmers is as follows: (1) Spring tares, after which the land is ploughed well and ridged for the winter; (2) barley or oats; (3) beans, with a good dressing of farmyard manure; (4) wheat with seeds; (5) wheat; (6) oats or barley. Other farmers take wheat followed by barley or oats, then beans, peas or clover, afterwards wheat, barley, beans or tares. There are some 6,000 acres under arable cultivation, of which one-half is devoted to wheat, oats, barley and beans; the yield of the grain crops is above the average of the county. Lucerne is somewhat extensively grown as a fodder crop. In June 1906 there were on the island 21,000 sheep (or one to every acre) besides 2,300 cattle. There is only a trifling extent of fruit-land, the soil being generally too cold and wet. Hops are not grown; a small area was planted in the parish of Warden about twenty years ago, but they were very soon abandoned. The farms in Sheppey are relatively large, averaging nearly 200 acres, and it is stated that land has depreciated in value to a greater extent in Sheppey than in any other part of Kent, the decline being put by Sir Charles Whitehead at over 50 per cent. since the prosperous time of arable farming.

THE HUNDRED OF HOO.—This is a peninsula projecting between the Thames and the Medway. With the Isle of Grain it has about the same area as Sheppey, which lies immediately to the east, and to which it presents somewhat similar characteristics. The soil is clay and loamy clay on the alluvium near the rivers and on the London clay in other parts, and is in some places very difficult to work in wet seasons. There is a larger extent of ploughed land than in Sheppey—about 9,000 acres, and the yield of grain is heavier. The principal crop is wheat, but the areas under potatoes, barley and oats are not much smaller. Wheat does well, and barley gives very fine crops, but the best malting barley is only obtained from soils of medium texture. Peas are much grown for podding; radish, mangolds and turnip seed are also largely grown, and green vegetables are cultivated for market. A fair amount of fruit

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is grown, chiefly in the parishes of Hoo, Cliffe and High Halstow, and in the last-named there is a small area of hops.

During the summer a large number of sheep—some 30,000—are kept in the district. Many are sent away for the winter as they cannot be folded on the heavy land. They return about the middle of April.

The average size of the farms is about the same as in Sheppey, and the depreciation in the value of land has been almost as great as in that island, rents being stated to have fallen from £2 per acre to £1 per acre between 1889 and 1899. Since that date there has probably been little change.

ROMNEY MARSH.—This interesting tract of country lies in the south-eastern corner of the county, adjoining the eastern end of the Weald. It comprises a total area of about 47,000 acres, the greater part of which has been recovered from the sea within historic times. On the south a process of natural accretion is continually going on, the gain at the extreme point being about seven feet of land every year. On the east side the Marsh is protected from the sea by the Dymchurch wall, a structure dating back to Roman, or possibly pre-Roman times. Almost as ancient is the Rhee wall running from Appledore to Romney. The area between these two walls was the first to be reclaimed and was in occupation at the time of the Romans, while the land to the south-west of the Rhee wall was inclosed at various periods up to the seventeenth century. Dugdale in his *History of Embanking and Draining* (1662) refers to the Marsh as a large and fertile tract of 24,000 acres more anciently secured from the inundations of the ocean than any other part of the realm.

Of the total surface some 36,000 acres, or about three-fourths, are cultivated, but only 7,000 acres of this are under the plough. The arable land is rich alluvial clay with an admixture of dry peat in places. The principal crops grown are wheat, oats and beans, the yield both of grain and straw being heavy; roots, clover and potatoes are also cultivated to a considerable extent, but scarcely any barley is grown. A few acres of hops are still to be seen in the neighbourhood of Ivychurch.

The remaining 29,000 acres consist of grass-land or marsh-pastures. These are of exceeding richness, and the number of sheep that they are capable of carrying will be a cause of astonishment to the observant visitor. In the summer-time there are from 135,000 to 140,000 sheep and lambs in the Marsh, and this is undoubtedly fewer than was the case thirty years ago. Many of the pastures are let along with the hill farms of Kent and Sussex; a good one will carry six sheep to the acre from April to October and three for the remainder of the year in addition to a few bullocks. Some will fatten out as many as ten sheep per acre during the summer. In the winter time the number of sheep is of course much smaller, as owing to the exposed character of the Marsh young sheep cannot be wintered in it, but are removed inland. They are sent away about October, some as far as Hertford and Essex, and do not return until the following April, graziers who have no upland ground paying 5s. to 6s. per score per week for their keep during the winter. When Boys wrote his report, a century ago, the charge was 2s. to 2s. 6d. per score. The sheep were returned on April 5, and, the writer states, in a bad winter frequently went home nearly starved.

At the time of the Crimean war the high price of corn led to some of the grass land being broken up, but the experiment proved a costly one, for subsequent experience showed the difficulty of relaying the land to grass—indeed the opinion is prevalent that it cannot be satisfactorily done.

The majority of the holdings are less than 50 acres in extent and the average size is about 80 acres of cultivated land. Twenty or thirty years ago rents ranged from £2 to £5 per acre, or even more for choice pieces of land, figures considerably higher than when Buckland wrote, in 1845. Since those times of prosperity it is considered that the pasture has fallen 50 per cent. and the arable land 75 per cent. in value.

Most of the Marsh is drained, although the greater part is from six to twelve feet below the level of the sea. The expense of maintaining the sea-defences is met by a 'wall-scot' charged upon the various owners whose lands are liable to inundation; this with the drainage-scot amounts to 5s. to 10s. per acre annually according to the outlay involved.

A branch of the South-Eastern Railway traverses the Marsh from Appledore to New Romney and Dungeness.

It may be appropriate in this place to mention the famous breed of Romney Marsh sheep, which is peculiar to Kent and takes its name from the district whence it was originally derived. The improvements which have led up to its present state of excellence commenced rather over a century ago when a yeoman farmer named Richard Goord selected nine ewes

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and a ram from Romney Marsh and set himself to establish a new type. 'Kent' sheep, as they were then called in the London market, had already acquired a great reputation for early maturity and a propensity to fatten, as well as for the superiority of their wool, which in good flocks averaged between five and six pounds per fleece. Sheep bred and fed on the inland farms differed somewhat from the typical Romney Marsh sheep, being more compact in frame and shorter in wool. By judicious selection and crossing of the two varieties they have become more or less merged in the one type possessing the best points of each of its constituents. Perhaps the best evidence of the suitability of this breed for all parts of the county is the fact that it literally 'holds the field' without a rival, for it is estimated that it comprises from 80 to 90 per cent. of the sheep in the county. The Romney Marsh is a hornless, white-faced breed, with a wide head, level between the ears. In a typical specimen the poll is well covered with wool and free from dark hair; the nose is coal-black. The fleece is of even texture and of a good decided staple from the foretop to the end of the tail. An average flock will give from six to seven pounds of wool per fleece, but marshland sheep, especially rams, will frequently clip much greater weights. It is customary to shear the lambs at about three months old and their fleeces give about a pound and a quarter of wool. Rams of this breed are in good demand for South America, and a few are sent to New Zealand. There is a 'Romney Marsh' flock-book, and some of the flocks registered in it have, it is claimed, been kept pure-bred for upwards of a century.

Hops.—From the time that the hop-plant was introduced into England, Kent has been the principal centre of its cultivation. In 1906 out of a total of 46,722 acres Kent contained 29,296 acres, or about two-thirds. In 1878, when the hop acreage of the country reached its highest point (nearly 72,000 acres), there were 46,600 acres in Kent alone. The fluctuations in acreage during the past forty years are shown in the following statement, which gives the average area for successive five-year periods, with the average rate of produce per acre so far as the figures are available:—

	Acres.	Cwt. per acre.
1867-71	38,923	—
1872-76	41,286	—
1877-81	44,087	—
1882-86	43,319	—
1887-91	35,953	6.9
1892-96	34,544	9.0
1897-1901	31,469	9.6
1902-06	29,875	9.0

It must be remembered that at the time when higher prices ruled a great deal of quite unsuitable land was planted not only in Kent but in other parts of the country and the foregoing figures should perhaps be interpreted as indicating, not so much the decadence of hop-culture, as its restriction to those localities where the conditions of soil and climate are specially adapted to it. There are about four hundred parishes in Kent, and the number in which hops are grown has dwindled from 313 to 232 during the last twenty years. Even now a good deal of land that is devoted to hops should be grubbed up, but the speculative instinct makes the farmer who has a few acres cling to them and devote to their cultivation an amount of time and capital that would probably be better expended upon some less hazardous branch of farming.

Upon the reduced area under cultivation the produce per acre has been greatly increased both by the planting of new and more prolific varieties and by the widespread substitution of permanent arrangements of posts with attachments of wire and string for the older system of temporary poles. During the early part of last century the average crop was about 6 cwt. per acre, and it may be said that the whole system of intensive cultivation has grown up during the last generation. At the present time, on the best lands, hops are without doubt the most highly-farmed and skilfully-managed crop in the world. The ordinary processes of cultivation require a large outlay, and in seasons when the plants are peculiarly subject to insect or fungoid attacks much additional expense is incurred by the grower through the necessity of spraying if the crop is to be saved from destruction.

New hops are usually planted in October or November, old orchard or pasture land being well adapted for the purpose; the plants are placed in rows six feet apart each way; this gives about 1,200 plants to the acre. Sometimes a crop, such as mangolds, is grown between the rows for the first year. Between November and March hop land is dug with the Kent 'spud,' an instrument with three tines which broaden out to a flat edge. The cost of digging an

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acre is from 18s. to 21s., and on this account, as well as from scarcity of labour, ploughing frequently takes the place of the thorough digging. The old bines are then cut off with a sharp curved knife. Manure of all kinds—farmyard dung, stable-refuse from London, rags, wool-waste and fish—is applied during the winter and dug or ploughed in. In the summer rape-dust, guano, nitrate of soda and various artificial manures are chopped in with the Canterbury hoe. The hop-plant requires training; in many parts, especially in the Weald, this is still done by means of temporary poles, of which two or three are set to each hill. But permanent structures of wire strained on stout posts are now common. By their use a greater amount of produce is obtained, the plant is healthier, and 'washing' is both facilitated and made more effective. The wires are re-strung every year with cocoa-nut fibre about one-fourth of an inch in diameter. Several different systems of tying obtain in Kent. In one of these, known as Butcher's system, there are three wires stretched along the poles, the first about six inches, the second about five feet, and the third, or top one, about twelve feet six inches from the ground. Three strings to each hill are fastened close together on the bottom wire; they branch out laterally to the middle wire and are then carried slantwise, but parallel to one another to the top wire in the adjacent row. In another somewhat less expensive system stout poles are placed at the end of each row, and at intervals in the row where required, and there is only one wire, viz. along the tops. Pegs are driven into the ground close to each hop stock, and from each peg four strings are carried outwards to the top wires. The strings are made taut somewhat by being gathered together about five feet from the ground, but the system is less stable than the one previously described and the plants require to be well 'lewed' or sheltered from the wind. For this purpose bine-screens are erected on the more exposed side. One advantage of the system is that it gives cultivation 'alleys' in several different directions. There are other methods of stringing each of which has particular advantages and drawbacks according to the character of the season and other circumstances. The initial cost of permanent poling may be put at £20 to £40 per acre. During the summer a great many women are employed in keeping the bines on the strings, earning from 1s. 6d. to 1s. 10d. per day at this pleasant and not very arduous labour. Attacks of aphids frequently necessitate spraying with quassia and soft-soap compounds several times during the season. This is done by hand, horse, or in some cases, steam power. Mildew is combated by the application of sulphur by means of a horse-drawn machine fitted with a revolving fan.

Picking commences about September and lasts for some weeks. A large number of immigrant 'hoppers,' estimated at 45,000 to 65,000, come into the county for the purpose. Most planters now engage their pickers beforehand, and the whole system is on a far more satisfactory basis than was formerly the case. Good pickers can earn from 4s. to 5s. per day, and the same persons are very often engaged earlier in the year for the fruit and pea-picking.

The hops are taken to the oast-houses to be dried. Buyers are becoming increasingly stringent as to the proper conduct of this operation which, in spite of its requiring considerable skill, is performed by the ordinary labourers without any special training. After about nine or ten hours' drying the hops are allowed to cool somewhat, and are then closely packed into 'pockets,' weighing 1½ cwt. Each pocket is marked with the name of the grower and his parish.

Besides this hops are classed for commercial purposes as 'East Kents,' 'Bastard East Kents,' 'Mid-Kents' and 'Wealds,' and these divisions agree in the main with those defined by the geological formations on which the several kinds are grown. Thus 'East Kents' are grown upon the Chalk and especially on the outcrop of the soils of the London Tertiaries upon the Chalk. 'Mid-Kents' are derived principally from the soils and outcrops of the London Tertiaries in the upper part of the district. 'Wealds' come from soils on the Weald Clay and the Hastings and Tunbridge Wells Lands. 'Bastard East Kents' were at one time largely grown in the small district lying between the Weald and East Kent proper, but this class is losing its importance as their cultivation is now almost entirely confined to four or five parishes on the borders of the Weald. Each of the other divisions contains about one-third of the hop acreage. East Kent hops usually make the highest and Wealds the lowest rates.

The capital required for hop-growing is, it may be judged, very considerable. The annual expense of cultivation varies greatly, but is far higher than it used to be. In 1795 Marshall estimated it at £26 per acre. Fifty years later Buckland computed the cost at £32 per acre. At the present time it probably varies from about £25 per acre on the poorest grounds in the Weald to £50 or more on the best farms of East or Mid-Kent. The speculative character of the crop is indicated by the fact that in 1905 the average yield per acre in Kent was 14½ cwt., while in the following year it was under 6 cwt. A short crop does

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not necessarily involve high prices as foreign supplies are usually available, but in spite of this fact and even with the attendant heavy expense of cultivation it is considered that hop growing pays fairly well on an average of seasons.

FRUIT.—In the growth of fruit, as in that of hops, Kent takes the foremost place amongst the counties of England. Of the 72,000 acres of small fruit and the 241,000 acres of orchards in the county, Kent contains 22,000 acres of the former and nearly 30,000 of the latter. In the case of orchards the Kent area was until recent years exceeded by that of several of the western counties, but although these have shared in the general extension of fruit-culture, the progress in Kent has been particularly marked. The following statement shows the number of acres under fruit in the county in periods of five years since the official returns were first obtained :—

		Orchards.	Small Fruit.
Average area, 1872-76		11,300	—
” ” 1877-81		13,920	—
” ” 1882-86		17,600	—
” ” 1887-91		18,350	14,920 ¹
” ” 1892-96		22,250	21,200
” ” 1897-1901		25,700	22,370
” ” 1902-06		28,770	22,340

The two sets of figures are not entirely independent of one another since a good deal of small fruit is of course grown under the trees in orchards, but they give a general indication of the rapid advance which has taken place during the last thirty years. But, indeed, the pre-eminence of Kent in fruit-growing is of no modern origin, for its reputation in this respect rests upon the experience of many centuries, and in particular the district of Teynham was renowned more than three hundred years ago as the special centre from which grafts of superior quality were supplied to growers in other parts of the county and country. The high standard of excellence attained there, and in Kent generally, was in no small measure due to the introduction of new and vigorous grafts from the neighbouring Continental countries. This enterprise on the part of a few individuals made it possible for Jeremy Collier, in 1688, to mention as a peculiarity of Kent ‘its great plenty of the best cherries and pippins in England,’ while Marshall, writing more than a hundred years later, observed that the practice of Kent might be safely recommended as ‘the fittest subject of study which the Island at present affords with respect to the management of orchard grounds.’

Every class of grower and of plantation is found, from the ordinary farmer with the old grass orchard, to the highly specialised fruit-grower having possibly 500 to 1,000 acres of fruit in mixed plantations. Speaking generally large holdings prevail in Kent and very little vintage fruit is grown, as it is found more profitable to grow apples for the table than for cider-making.

Small fruit is principally grown in North and Mid-Kent. Here strawberries, raspberries, currants and gooseberries are produced in large quantities. In the neighbourhood of London many farms are devoted entirely to fruit, and it is in such cases that the cultivation is most remunerative, since the grower is in a position to acquire the scientific and technical knowledge which, whether applied to the choice of ground, the selection of varieties, or the methods of cultivation, is not the least important feature of successful management.

As regards orchards, with the important exception of the region between Chatham and Canterbury there is no great extent in East Kent. Elsewhere in the county the distribution is fairly general, and most farms where the land is suitable have a considerable acreage of fruit attached. But taking Chatham as a centre, the country west, south and east within a radius of fifteen miles and extending a little further eastwards to Canterbury contains approximately two-thirds of the Kent orchards.

Great improvement has taken place of late years in the management of fruit-land, especially of cherry and apple orchards. More care is now taken not to exhaust the ground by mowing, the grass being fed off by animals having supplies of other food. Poultry, too, will often be seen foraging about in the orchards, and by these means as well as by the liberal use of manures the land is kept in good heart and the produce greatly increased. In the case of apples, pears and plums half-standards, pyramids and also dwarfed or bush trees have in many cases taken the place of old standards. The dwarf trees are planted eight to ten feet apart; they come to bear in two or three years and are more easily cultivated, pruned, sprayed and picked. Sometimes strawberries or vegetables will be grown between them for the first two or three years. The distances at which standard trees are planted are generally, for cherry and apple

¹ 1888-1891.

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trees on grass, thirty feet each way, and for apples and pear trees from twenty to twenty-four feet upon arable land, with strawberries or bush fruit, such as gooseberries and currants, under them. Another arrangement consists in putting standard apple or pear trees thirty feet apart and setting bush trees of apples or pears fifteen feet apart between them; the latter come quickly into bearing and are removed when the standards are fully grown. Occasionally gooseberry or currant bushes, raspberry canes or strawberry-plants are set between the bush trees and taken away directly they interfere with their growth. Half-standard apple or plum trees are set triangularly fifteen feet apart, with strawberry plants at distances of eighteen inches in rows thirty inches apart. Or again, bushes will be set between the half-standards and strawberry plants between the bushes.

By these means the land is made to produce up to its full capacity, but such high farming necessitates the application of great quantities of manure. The kinds made use of include London manure (except where hop-growing absorbs it all), fish-refuse, rags, shoddy and wool waste, soot, bone-meal and various 'artificial' manures such as superphosphate, nitrate of soda, kainite and sulphate of ammonia. Fruit plantations are always dug by hand with the Kent spud, and never ploughed, as is done in America. Young trees benefit by being kept clear of grass for some distance round, though with older trees whose roots have attained some depth this is less necessary. To check the constant attacks of insects and blight, spraying with various emulsions and solutions is regularly practised by the best farmers. This is done in the early spring before the blossom is out and is a laborious, though eventually economical, process. It also pays to employ bird-scarers, some birds working great havoc amongst the fruit bushes when the young buds appear. Late spring frosts are sometimes a cause of heavy loss to the growers. No serious attempt can be made to guard against them, though this is occasionally done by burning rubbish and producing dense smoke.

Intensive fruit-culture is thus only less expensive than that of hops and it is equally subject to great vicissitudes. On the one hand the crop may be insufficient to cover the cost of its growth, while on the other hand in an abundant season the markets will sometimes be so glutted that the fruit will not realise the expense of picking and is left to rot. Frequently crops are sold by agreement while still growing; in other cases growers contract to supply a stipulated quantity of a particular kind to jam factories. A few of these have been established in the county itself, and are a great advantage to the neighbouring farmers. Growers have been driven, by the competition of foreign varieties, to pay far more attention to the picking, grading and packing of fruit, as well as its marketing. Formerly all was consigned to London, but now much of it is sent North, some as far as Edinburgh. A well-managed fruit-farm will probably, from one season to another, yield the owner a very fair profit, though less perhaps than in former years. A plantation of about fifteen acres near Maidstone is stated to have shown from 1831 to 1862 an average return of £562 a year.

Besides fruit-growing Kent also enjoys a reputation for its filberts and cobnuts. These are grown principally on the sandy clay 'Coomb' and other Ragstone soils in the neighbourhood of Maidstone. The nuts are of proverbial excellence and are in great demand not only for the London market but also for America. The trees are closely pruned and kept to a height of 5½ to 7 feet on stems 18 inches to 2 feet high. Pruning is an expert operation and is often a hereditary craft in the villages near Maidstone, but skilled cutters are not so common as they once were. Possibly on this account, as well as from the fact that a long time must elapse before the trees come into full bearing, their cultivation is stated to be not much extending in spite of the generally profitable character of the industry.

POULTRY-FARMING.—This industry is an old-established one in Kent, which was famous some centuries ago for the size and quality of its poultry. Somewhat neglected during the prosperous times of the last generation, the necessity for turning the smaller branches of farming to profitable account has caused renewed attention to be paid to the rearing of birds and their fattening for market. Many farmers, especially in the Weald and in Romney Marsh, rear poultry for sale to the agents of fattening companies. A few do the fattening themselves, either rearing the birds they require or buying from the surrounding farms. Buff Orpingtons are extensively kept as this breed is liked by the crammers. For a few birds the hand-cramming process is suitable, but with a larger number it is too tedious and a poultry-cramming machine is used. The food consists chiefly of 'Sussex' ground oats, so-called from its being used in the more extensive establishments of the neighbouring county. Actually, Russian oats are made use of, with a small proportion of barley, and this mixture is ground, husk and all, to a fine flour, quite different in character from the oatmeal of commerce. As a poultry-food Sussex oats forms an almost perfectly balanced ration.

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WOODLANDS, HEDGES AND FENCES.—Kent is a well-wooded county. Its woodlands occupy 99,000 acres, or rather more than one-tenth of the whole surface, and they are better cared for than in some counties in consequence of the demand for hop-poles. Fully three-fourths of the area consists of coppice of which a larger extent is found here than in any other county. Marshall observed that the Kent yeomen excelled in the management of coppice woods, £40 an acre being sometimes realised for ten years' growth. The price of hop-poles then (about 1790) ranged from 14s. to 40s. per thousand, and as they were not creosoted, and consequently were of shorter duration, the demand for them was far greater than at present, and in some parts woodlands were the most valuable estates in the county. Near Maidstone £50 an acre was made for some eleven years' growth on a poor soil, while a plantation of chestnut, the most valuable of any sort for hop-poles, made £104 per acre for a fall of only nine years' growth. Buckland, in 1845, mentions woodland in the Weald which was worth £40 to £45 per acre for every fall of ten years' growth. Thirty years later falls of the best plantations of ash and chestnut occurring every eighth or ninth year brought from £40 to £60 per acre. The reduction in the hop area, the invariable creosoting of the poles, and the adoption of permanent systems of poling the hops, have combined to cause a great fall in the value of Kent woodlands. The average price of ordinary woodland in hop districts is hardly more than £12 10s. per acre, and that of plantation land about £30. On account of the demand for stout poles for wire and string work the timber is not cut so early now by at least two years. The falls are sold by auction every autumn, being frequently bought by 'wood-buyers,' who cut the wood in the winter, sell the poles and other produce, and work up the remainder or make sheep-gates and hurdles during the spring and summer.

The fences are usually well kept on the best-managed farms, but there is a noticeable difference in this respect in the Weald, where they are often rough, untrimmed and wide-spreading.

The hedges of Mid-Kent deserve special mention. Buckland observed that this part of the county was unrivalled for hedge management. They are commonly quickset, and growing to a height of 18 to 25 feet serve as lews or shelters for hop and fruit plantations. Yet being kept to a width of but 2 or 3 feet they occupy little more space than a wall would require.

TECHNICAL EDUCATION.—An account of Kent agriculture, however brief, would be incomplete without some reference to the work carried on by the South-Eastern Agricultural College at Wye. This institution is doing good work by educating farmers' sons and others in practical and scientific agriculture. It offers special advantages to residents in Kent and Surrey, and the County Councils of both counties, as well as the Government, make grants for its support. There are at present 99 students. The College possesses a farm of 460 acres, 176 acres of which are arable, a herd of Lincoln Red Shorthorns and typical cattle of other breeds. Romney Marsh, Southdown and other sheep are kept, and experiments are carried on with the view of early maturity and capacity for fattening. Experiments are also conducted in hop-growing, while fruit-growing and glass-house culture, dairying, bee-keeping, poultry-farming, forestry and farriery all form subjects of regular courses of instruction. These, with purely scientific courses, extend over two, three or four years.

Analyses of soils, manures, feeding-stuffs, etc., are undertaken by the College on behalf of farmers resident in the county, and lectures on all branches of farming are given at about six centres. Recently the College has conducted an inquiry into the soils of Kent and Surrey with the view of ascertaining the most suitable manures for particular crops. Mechanical and chemical analysis have suggested the advantage to be derived from liming the London Clay soils and of adding a phosphate manure for cereal cultivation. The Chalk soils being warm and dry derive special benefit from organic manures. Folding off roots and ploughing in a green crop in the autumn are calculated to effect great improvement. Phosphates and potassic manures are necessary for the proper growth of roots, especially on the soils of the Upper Chalk. The most profitable use to make of the Gault soils is, it is suggested, to lay them down in grass, drain them and treat liberally with chalk, and occasionally with basic slag, the latter being a very valuable manure on these soils.

With so many and such varied branches of their industry, and with an ever-widening market at their doors, it may be hoped that the farmers of Kent will enjoy an increasing measure of prosperity, and that in adapting themselves, as many of them have done, to the changed conditions of modern times, they may long continue to occupy a prominent position as exponents of the science and practice of agriculture.¹

¹ Acknowledgment is due to Sir Charles Whitehead, of whose 'Sketch of the Agriculture of Kent' extensive use has, by his permission, been made.

FORESTRY

THE main feature of the county of Kent is the great central mass of chalk known as the North Downs, which stretches from a point on its western boundary, a little to the north of Westerham, to the chalk cliffs of Dover. This backbone of the county is broken in three places by the valleys of the Darent, Medway and Stour; but, notwithstanding these interruptions, it forms a natural barrier through the county, dividing it into two rather unequal portions, with a slope to seaward and the estuary of the Thames on the one side, and a dip into the Weald valley on the other.

The whole question of the Forest of Anderida or Andred has been exhaustively discussed and illustrated by maps by the late Mr. Furley, and particular attention given to the distribution of the dens or denes.¹ He holds that little progress was made during the Roman occupation in bringing into cultivation the forest of Andred, owing to the density of the wood and the nature of the soil. It was in verity a forest according to the modern use of the term, for it is generally mentioned as a *sylva*, and did not imply a district reserved for royal game with many a great open space. This vast wood, stretching right away from the coast of Kent over the north of Sussex and through part of Surrey into Hampshire, which must have been by far the greatest wood in South Britain, if not in the whole of the kingdom, became subsequently known as the Weald. In Saxon times, when there came about a distribution of lands, those tracts not thus assigned were considered as belonging to the Crown, and Mr. Furley and others have proved that this was the case with the forest of Andred, or the Weald. Later Anglo-Saxon sovereigns granted rights over it or parts of it, chiefly to the Church; but 'we have no evidence that it was at any time a private forest of the sovereign, or that there was ever a reservation of vert and venison in any part of it. No forest laws have come down to us.'²

By a slow and gradual process, this gloomy forest, frequented at first only by herdmen with their swine and cattle, became the permanent abode here and there of settlers who rid patches of the timber and brushwood, establishing themselves on the clearings that they cultivated. The dens or hollows of the Weald appear to have been specially useful as feeding places for the swine in Kent, whilst in Sussex they afforded shelter for the sheep as at Ovingdean, Rottingdean, etc.³ The district was in no way favourable for deer or royal game.

The Weald, so far as Kent is concerned, stands out in an exceptional and remarkable position at the time of the Conquest, as is shown from the Domesday Survey; there was a significant absence of mention of both (1) manors and (2) waste lands throughout the greater part of that district. Such parts, however, of the Weald as had not been inclosed were claimed by the Conqueror, and parcelled out as small manors among his favourites, such as Odo, Bishop of Bayeux.⁴ Yet a very considerable proportion of the Kent Weald escapes mention in the Survey; it was the common land of the county. The Hundreds of Barkley, Great Barnfield, Little Barnfield, Brenchley and Horsmonden, Cranbrook, Marden, and Tenterden, now in the very centre of the Weald, are not referred to in any way in the Survey. Mr. Furley also supplies a list of villas and manors situated wholly or in part within the Weald and not to be found in Domesday by name, although dens belonging to neighbouring villas had in most cases been formed. This list of forty-four includes such well-known names as Ashurst, Biddenden, Chevening, Hawkhurst, Penshurst, Sandhurst, Tonbridge, and Sevenoaks.⁵

This is the reason why, in a county so densely wooded in parts, as must have been the case with Kent at the time of the Survey, the number of swine that could find pannage is so very much smaller than on the manors of many other counties which were probably far less

¹ Furley, *Hist. of the Weald of Kent*, 3 vols. (1871).

² Lower, *Hist. of Sussex*, i. 5.

⁵ *Ibid.* i. cap. 21.

² *Ibid.* i. 203-5.

⁴ See Furley, *op. cit.* vol. i. cap. 31.

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well wooded. The size of the woods on the different manors of Kent that are mentioned in the Survey is roughly given by the total of the pigs they could support. At the head of the list comes Wye, four miles to the north-east of Ashford, with 300 pigs; this is followed by Milton, 220, and by Boughton Aluph, 200. Otford and Yalding had each sufficient woods for 150 pigs, Pluckley for 140, and only four other manors for 100 or upwards. Some of the Domesday Commissioners reckoned the number of the swine as those that were payable to the lord in recognition of pannage rights, but there is no doubt from the form of expression in a few of the Kent entries that the total of the swine turned out for feeding is implied; thus at Wye the entry names *silva ccc porcorum de pasnagio*. In thirteen cases there is distinct mention of pannage and not merely of the number of the swine.

There are twenty-four separate references to denes in the Kent Domesday, and in six of these cases they are expressly described as being denes of wood. Thus at Dartford the king held of wood eight small and three large denes; at Orpington there were five denes of wood for fifty swine; at Milton three denes for thirty swine; and at Hawley and at Ridley one dene for five swine; at Norton there is mention of one little dene of wood, but pigs are not named. An interesting entry under Blean mentions that it contained 1,000 acres of fruitless wood (*sylvae infructuosae*), that is of wood that was neither oak nor beech to supply acorns or mast for the swine. In three cases there is mention of small woods fit to provide fencing (*silvulae ad clausuram*). There are two references to alder (or possibly osier) beds, namely on the king's manor at Dartford, and on the Bishop of Bayeux's manor of Berdewelle which has not been identified. A good many of the manors mentioned in the north of the county contain no reference to woods, and in several others the amount of wood was so insignificant that it could only find pannage for a single pig, or for two, or for three. There is one reference to deer throughout the county. The Bishop of Bayeux held at Chart Sutton a park for beasts of the forest.

A scholarly estimate formed as to the chief woods of Kent, Surrey, and Sussex after the Conquest supplies the following list for the first of these counties. The great Andred Wood or Weald, extending into Sussex and Surrey; Blean Wood, in Westgate Hundred, containing the 1,000 acres of unpannaged woodland of the Domesday Survey; Bochole, probably Boughton-under-Blean; Caestruwarowalthe Wood, probably the woods between Rochester and Maidstone; Challock Wood, part of which is now included in Eastwell Park; Chart Wood, in the hundred so called; Norwood, near Herne Bay; Ripwood, on the borders of Sussex, near Romney Marsh; Saenling Wood, in Eastry Hundred; Saltwood, near Hythe; Sandhurst Wood, on the southern fringe of Andred Weald; Shoreham Wood, north of Sevenoaks; and Westwood, near Graveney.¹

Although there was no royal forest in Kent, of which there is any record, after the Conquest, the kings of England had two royal parks in the county, namely those of Eltham and Greenwich, the former of which was by far the older.

Eltham was a royal residence in the time of Henry III, and there the king and his court kept the Christmas of 1270. It was subsequently in the hands of Anthony Bek, the great Bishop of Durham; but that prelate, who died here in 1310, left the reversion of it, with all the improvements he had made, to Queen Eleanor.² When John, king of France, honourably returned to England in December, 1363, Edward III was staying at Eltham. Froissart gives a glowing account of the magnificence of the palace and of the splendid reception given there to the royal captive and guest.³ Two Parliaments of this reign, held respectively in 1329 and 1375, were summoned to Eltham, and here Richard II frequently resided, enjoying the hunting in the various parks by which it was surrounded. The manor of Eltham was used much by successive sovereigns for entertainments and for the sport of hunting until the days of Henry VIII when Greenwich came into favour. Henceforth Eltham saw little of royalty. Among the various offices showered by Elizabeth on her favourite, Sir Christopher Hatton, was that of keeper of the palace and parks of Eltham. Charles I granted the office of keeper of the great park of Eltham to Patrick Maule, groom of the bedchamber, at 6*d.* a day, and he also held the offices of ranger and master of the game, to each of which certain perquisites were attached.

After the king's execution, a careful survey was made of the Crown possessions at Eltham, early in 1649. The area of the parks was considerable; it was found that the Great Park comprised 596 acres; the Little or Middle Park 333 acres; and Home or Lee Park, which

¹ Pearson, *Hist. Maps of England*. ² Furley, *op. cit.* ii. 112, 247; Hasted, *Kent*, i. 50-1.

³ Froissart, *Chron.* (1803), i. 609-10.

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was in Eltham and Lee, 336 acres. The deer of all three parks had been destroyed by the soldiers and common people during the preceding summer, and much of the park palings broken down and destroyed. In the first two of these parks, the Commonwealth surveyors marked 2,200 of the best trees to be reserved for the navy; the trees left standing numbered 1,386, and were valued at £586. In Home Park, where most of the 2,620 trees were old and worn out, none were marked for the navy; their value was estimated at £917. The whole estate must have been splendidly wooded, for 3,700 trees on the Eltham demesnes were marked for the navy in addition to those in the parks.¹

Evil befel the timber of Eltham during the Commonwealth period, apart from that felled for navy purposes. Mr. Shirley cites from a book, published in 1660, called *The Mysteries of the Good Old Cause*, to the effect that 'Sir Thomas Walsingham had the Honour of Eltham given him, which was the Earl of Dorset's, and the Middle Park which was Mr. White's; he has cut down £5,000 worth of timber, and hath scarcely left a tree to make a gibbet.'²

Greenwich had from early days been a royal residence, but there is no record of a park here until 1433, when Henry VI licensed Humphrey, duke of Gloucester, to inclose 200 acres of land pasture and wood at Greenwich to make a park. Within the park the duke erected a tower termed Greenwich Castle, now the observatory, and a spacious residence on lower ground. All this reverted to the Crown on his death in 1447.³ It became a favourite residence of Henry VII, Henry VIII, and Elizabeth.

Hentzner, when travelling in England in 1598, makes this mention of Greenwich: 'Near this place is the Queen's Park, stocked with deer; such parks are common throughout England, belonging to those that are distinguished either for their rank or riches.'⁴

James I was often resident at Greenwich, and here were born his children. His queen, Anne of Denmark, took particular pleasure in Greenwich Park, and there laid the foundations of the 'House of Delight,' which afterwards served as the ranger's lodge.

When Greenwich palace was turned into a hospital for aged and disabled seamen in 1694, the park was disjoined from the palace and still continues vested in the Crown. The park was walled round by James I, and includes 188 acres. It contains some fine timber, particularly elms and Spanish chestnuts. There is a herd of about 100 fallow deer; on Bank Holidays and special occasions, when there is great public resort to the park, the deer are confined to a small paddock.

The chief episcopal parks of Kent were those of Otford and Aldington. The manor of Otford belonged to the see of Canterbury from the close of the eighth century onwards. The manor-house of Otford was a favourite residence of many of the primates, and here Archbishop Winchelsey died in 1313. There were two parks on the estate, distinguished as the Great and Little, but the latter was disparked during the reign of Edward VI. The keeper of the Great Park, which was 700 acres in extent, had a yearly fee of £6 3s. 4d., and the keeper of the Little Park £6 1s. 8d. Archbishop Cranmer exchanged Otford for other property with Henry VIII. It is of the Great Park of Otford that Lambard has put a foolish tale on record as to St. Thomas of Canterbury:—'As Thomas à Becket walked on a time in the Olde Parke (busie at his prayers), that he was muche hindered in devotion by the sweete note and melodie of a nightingale that sang in a bushe beside him, and that therefore (in the might of his holynesse) he enjoined that from henceforth no byrde of that kynde shoulde be so bolde as to sing thereaboutes.'⁵

The vast manor of Aldington, by far the largest in the county and lying chiefly within the forest or Weald, was also one of the earliest endowments of the see of Canterbury. Here the primate had a great park adjoining the manor-house. The Hundred Rolls of 1275, among a list of many irregularities, show that Master Richard de Clifford, the escheator, sold wood in the Archbishop's park at Aldington, at the time of the vacancy of the see of Canterbury, to the value of 66s., and took twenty deer and more in the same park.⁶ This estate was also alienated by Archbishop Cranmer to Henry VIII, who coveted every possible hunting ground within reasonable reach of London.

There are several brief records as to the inclosing of parks in the woodlands of Kent among the Patent Rolls. William de Say, in 1262, gained the licence of Henry III to impark his wood of Hanger within the bounds of the forest of Pembury.⁷

¹ Parl. Surv. Aug. Off., cited in Hasted's *Kent*, i. 52-3.

² Shirley, *Deer and Deer Parks*, 70.

⁴ Lysons, *Environs*, i. 519.

⁶ Furley, op. cit. ii. 137.

³ Hasted, *Kent*, i. 19.

⁵ Lambard, *Perambulation of Kent*, 37.

⁷ Pat. 46 Henry III, m. 20.

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Edward II, in 1325, granted licence to David de Strabolgi, Earl of Athol, to impark his wood called Northwood, on the manor of that name, in the hundred of Whitstable.¹

Licence was granted by Edward III, in 1341, after inquisition *ad quod damnum*, to Geoffrey de Say to inclose 100 acres of land and wood in Birling, together with a path between the land and wood, and to impark the whole, on condition of making elsewhere on his own soil a path for the public of equal length and breadth.²

In 1360, the same king confirmed to the Archbishop of Canterbury the concession made to him by William Morunt, namely that neither William nor his heirs would ever in the future make any park or warren in his demesne lands or holdings in Chevening to the prejudice of the archbishop's free chase.³ Leave was granted in 1360 to Stephen Ashway to inclose ninety acres of land and twenty acres of wood in 'Brokesham,' for the purpose of enlarging his park.⁴

The accounts of William Payne, deputy in Kent of 'Robert Henneage Esquier, Master of the Kynges highness Wooddes' for the year ending Michaelmas, 1533, show receipts amounting to £25 16s. 4½d. resulting from wood sales in the county. Three acres of wood that had a growth of about sixteen years on Shotover Hill, in the manor of Eltham, much spoiled by the cattle for lack of inclosing, were sold at 15s. the acre to several residents. About six acres of adjoining wood of like age but not so much spoiled were sold at 17s. the acre to other inhabitants of Eltham. Other damaged coppice wood on the same manor sold at 18s. the acre, and one lot of seven acres, very much spoiled, at only 10s. the acre. Four beeches sold in Dolldyngbery Wood, parcel of the late priory of Tonbridge, realised 30s. Certain tops sold in the manor of Bayhall, remaining of the timber appointed for the building of South Frith Lodge, fetched 13s. 4d.; the tops of timber felled for repairing the king's mill at Tonge brought in 4s., and five acres of wood sold at another time produced over £4. The outgoings were inconsiderable, amounting to £3 8s. 4d., which sufficed to cover the expenses of Payne with two horses during his various journeys to Eltham and elsewhere in the county when measuring and selling the wood.⁵

William Lambard, writing in Elizabethan days of the Weald, considered that this district 'was a great while together in manner nothing else but a Desert, and waste Wildernesse, not planted with Townes, or peopled with men, as the outsidies of the shyre were, but stoared and stuffed with hearded Deere and droves of Hogs any.'⁶

'Parkes of fallow Deere, and games of gray Conyes, it (Kent) maynteineth many, the one for pleasure, and the other for profit, as it may wel appeare by this, that within memoire almost the one halfe of the first sorte be disparked, and the number of warreyns continueth, if it do not increase dayly. As for red Deere and blacke Conyes, it nourisheth them not, as having no great walkes of waste grounds for the one, and not taryng the tyme to raysethe gaine by the other; for blacke conyes are kept partly for their skins, which have their season in Winter: and Kent by the nearnesse to London hath so quick market of yong Rabbets, that it killeth this game chiefly in Summer.'⁷

In Lambard's list of parks, drawn up in 1571, eighteen are set down that had been already disparked, namely those of Panthyrst, Brasted, Henden, Hever, Broxam, Wrotham, Ightham, Cage, Postern, Sutton, Langley, Allington, Mereworth, Lye, Folkestone, Stonehyrst, and two at Oxenhoath. The parks still existing in Lambard's time were Knole, Groombridge, Penshurst, Cooling, Birling, Cobham, Greenwich, Ashoure, Southpark, Lullingstone, Calehill, Leeds, St. Augustine's, Bedgebury, Westenhanger, Halden, Hamswell, Hungershall, Shorling, Stowting, Postling, Ashford, Sissinghurst, Glassenbury, three at Eltham, three at South and North Frith, in the south-west corner of the county, and two at Otford, in all thirty-two.⁸

Only three of the many deer parks enumerated by Lambard now survive, namely those of Knole, Cobham, and Lullingstone.

In Hasted's famous history of the county, published in 1778, some attention is paid to the general question of the trees and woodlands. As to orchards of apples, pears, plums, and cherries, they are stated to be in great number everywhere—but not so much as formerly, especially of the latter, many of them having been destroyed of late, and converted into hop grounds.' Plantations of apples and filberts were specially abundant in the neighbourhood

¹ Pat. 18 Edw. II, pt. ii. m. 14.

² Pat. 33 Edw. III, pt. iii. m. 9.

³ Exch. Accts. K.R. bdle. 149, No. 16.

⁷ Lambard, op. cit. 9.

³ Pat. 15 Edw. III, pt. i. m. 11.

⁴ Pat. 41 Edw. III, pt. i. m. 19.

⁶ Lambard, op. cit. (1576) 168.

⁸ Ibid. 48-9.

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of Maidstone. The coppice wood in general was either oak, hazel, birch, or beech, intermixed with ash, willow, and chestnut, of the last of which there were large tracts at Milton, near Sittingbourne, and at Newington. The timber in the woods was chiefly oak and beech, but in the hedgerows generally elm. The oaks were specially large round Maidstone, and felled from time to time for the navy. Hasted further reported that the only remains of a forest in Kent was near Tonbridge, in the parts called South and North Frith, most of which was then woodland.¹

'The soil of the Weald,' wrote Hasted in 1778, 'is particularly adapted to the growth of the oak, which in these parts increase to an amazing size; one of which was felled a few years ago at Penshurst in the park there which had twenty-one tons of timber in it, or 840 ft. Every inclosure in the Weald is surrounded with these trees, and every coppice and wood is full of them; and though they yearly afford a supply for the royal navy of Great Britain, yet in all probability there will be sufficient remaining for the use of it for ages yet to come.'²

In 1794 John Boys, farmer of Betteshanger, drew up a report for the Board of Agriculture, termed *A General View of the Agriculture of the County of Kent*.³ The tenth chapter deals with the woods and plantations. The woodlands of the eastern part of Kent are described as chiefly dispersed between the great road from Rochester to Dover, and the chalk hills that run from Folkestone, by Charing, to Detling. These woods furnished the county with fuel, with tillers for husbandry use, with timber for shipbuilding, and more especially with poles for the hop grounds. The best first-class poles were chestnut, ash, willow, and maple; their usual length 18 ft.; the price varied from 30s. to 39s., per hundred, chestnut being the dearest. Mr. Boys supplies an elaborate table of the chief woods of the county, which were treated on a commercial basis, giving their acreage, owner, surface and subsoil, natural produce, extra produce from improvement, and articles for sale. The largest of them was the King's Wood, on the Sussex border; it was of 3,000 acres and chiefly in the parishes of Goudhurst, Cranbrook and Ticehurst; it was mainly oak and used for little more than fence poles and fuel. There was another great wood of 1,500 acres, also called King's Wood, in the parishes of Langley, Leeds and Sutton; it grew large quantities of oak, with some hazel and birch, and was used for tillers, small timber, and poles. A third large wood, of 1,000 acres, termed Bridge Wood, was in St. Margaret's parish; it was chiefly oak, but had been improved by chestnut and ash, and produced poles, cordwood, etc. One of the most flourishing was a 300-acre chestnut wood of the Earl of Aylesford, in Newington and Milton. On Burham Downs there was about 1,000 acres of scrubby oak and hazel, which was on the waste, and free from November to March. The total woodland acreage of this table amounts to 13,290 acres.

A considerable portion of the two volumes of Marshall's *Rural Economy of the Southern Counties*, published in 1798, is devoted to the district round Maidstone. He found that the old woodlands of this part of Kent were increasing, chiefly owing to an increased demand for hop poles. The woodlands were chiefly coppice, with a few timber trees scattered among them. The species of woods in the old or natural coppices were chiefly oak, ash, hornbeam, saw, and maple. The provincial name for the hornbeam was horse-beech, in contradistinction to the buck-beech or true beech. The saw was locally known as the 'plumb-leaved willow.' The age of felling the old coppice woods was from twelve to eighteen years' growth. The chestnut was being largely planted, as it was found to run up rapidly and straight, and produce poles of good value. Next to the chestnut, the ash was the favourite in the new plantations. The new coppices were cut about every ten years.⁴

In his reflection on the 50 square miles of the Isle of Thanet, Mr. Marshall comments on 'the extreme nakedness of this plot of country,' and urged that the steep hangs of the hillocks towards the coast, and the worst of the flinty heights might with advantage be planted for the growth of coppice wood.⁵

The existing deer parks of the county number fifteen, of which Greenwich has been already described; they are the parks of Knole, Eastwell, Lullingstone, Cobham, Chilham, Godmersham, Waldersham, Mereworth, Surrenden Derring, Boughton, Mote, Mersham Hatch, East Sutton, Hall Place, and Greenwich.

Knole Park, adjoining Sevenoaks, the seat of Lord Sackville, is one of the most interesting

¹ Hasted, op. cit. i. 123.

² Ibid. 135.

³ It was reprinted in 1796, and a third edition issued in 1813.

⁴ Marshall, *Rural Econ. in the Southern Counties*, i. 39-50.

⁵ Ibid. ii. 40-1.

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and best timbered of all the parks of England. It is about 2 miles in length from north to south, and $1\frac{1}{4}$ in width from east to west. The acreage within the park wall is 923 acres, of which about 400 acres are woodland. The scenery is most diversified, and presents a charming variety of hill and dale, with bold stretches of open land on the higher levels. The timber in certain parts is exceptionally fine, and there are various stately avenues. The park is entered from Sevenoaks by a gateway nearly opposite the church through Knole Avenue, which is a fine grove of beeches. After gaining the park the road crosses a grassy glade or valley, and turning to the left mounts the hill and passes through a stretch of forest trees, chiefly well-grown beeches, a considerable number of which measure about 9 ft. in girth, 3 ft. from the ground, and have remarkably straight stems. On gaining the front of the great house a variety of good sycamores may be noticed, whilst to the right hand is a solitary monarch beech tree of stately proportions; it has a girth of 27 ft. 6 in., 3 ft. from the ground. From the north-west corner of Knole House is a fine avenue of oaks termed the Duchess Walk, 500 yds. in length, leading in the direction of Godden Green. This and other avenues near the house would have more dignity had they been planted further apart. The oaks of the Duchess Walk are but 20 ft. apart; several of the largest have a girth of from 12 to 13 feet. A short distance from the lower end of this walk stands the King Beech, which has a circumference of nearly 28 ft., but it is not so well grown as the great beech by the house, as it is divided into several huge stems a short distance from the ground; it is of great age and is now on the down grade. In this part of the park may also be seen the Old Oak, now a mere wreck; it bore this name as far back as 1650, and it is just possible that the writer who considers it 'old enough to have sheltered barons and knights of the era of the early Plantagenets' may be correct in his surmise. Another fine old tree in much better preservation possesses the misleading title of King John's Oak. The Broad Walk is an avenue nearly a mile long and chiefly of beech, which extends from the Bird House to the most southern part of the park known as the Mount, from which there is a splendid prospect over almost the whole of the Weald of Kent. The approximate number of deer inclosed in this noble park is fallow 320, red 120, and Japanese 70.

During the last fourteen or fifteen years, in addition to filling up vacant places in the existing woods, plantations of larch, Scotch fir, Douglas fir, etc., with oak and chestnut, etc., have been formed in the park and elsewhere on the estate and are generally doing very well. At Seal Chart the process of natural regeneration of Scotch fir is going on, but great damage is done from time to time by fires.¹

Immediately adjoining Knole is The Wildernesse, a most richly wooded estate in the parish of Seal. Here Lord Chief Justice Pratt, who died in 1714, inclosed a park; but it was disparked after the death of the first Marquis Camden in 1840.

Eastwell Park, the seat of Lord Gerard, is of great extent, embracing the greater part of the parish of Eastwell, as well as portions of the adjoining parishes of Challock and Boughton Aluph. It is stocked with about 1,000 fallow deer; the red deer are now extinct. The old Pilgrims Road to Canterbury passes through the park; it can be traced by the old yew trees.

The deer park of Lullingstone Castle, in the beautiful valley of the Darent, the seat of the Right Hon. Sir W. Hart Dyke, bart., has an area of 720 acres and is stocked with about 200 fallow deer. It is remarkably well wooded.

The deer park at Cobham Hall, the seat of the Earl of Darnley, contains 538 acres and is very well timbered. In it are some of the tallest ash trees in England, many of them over 140 ft. high, also magnificent oaks, Spanish chestnut, hornbeam and sycamore. At the present time there are about 400 deer. The timber is well kept up, and a considerable number of trees are planted every year when felling or thinning takes place. The area of other parks surrounding the mansion but not open to the deer is about 120 acres, while the total area of woodland on the estate extends to some 1,400 acres.²

The park round Chilham Castle, the seat of Colonel Charles Stewart Hardy, which adjoins Godmersham Park, has an area of about 300 acres and is stocked with 100 head of fallow deer. It is well timbered and includes some very fine Spanish chestnut and beech trees; several of the former grand old trees measure as much as 23 ft. in girth at 4 ft. from the ground. A great feature of the park is the large heronry, the nests of which average from 80 to 100 a

¹ From personal observation and measurements, but chiefly from particulars kindly supplied by Mr. G. H. Brougham Glasier, the estate agent.

² From information kindly communicated by Mr. C. H. Scriven.

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year. On this estate from five to ten thousand young Spanish chestnuts and ashes are planted yearly, both for game and commercial purposes.¹

Godmersham Park, the seat of Mr. Ellis Cunliffe Lister Lister-Kay, incloses an area of 560 acres; it is now stocked with a herd of 120 fallow deer, reduced from 400. There has been very little planting done on the estate for the last thirty years, other than for landscape purposes. Mr. Lister-Kay does not think that it is likely that any more planting will be undertaken, although there is a considerable area of derelict land, until the landowner is relieved of the payment of all rates and taxes for a period of not less than thirty years on such land, conditionally on his planting it. The land in question, though unused and bringing in nothing to owner or tenant, still bears a heavy tithe, the system of farm apportionment obtaining in this district instead of field apportionment.²

Waldershare Park (Earl of Guilford) incloses an area of about 500 acres. The herd of fallow deer is kept down to about 150. The park is richly wooded, the principal features being numerous clumps of very fine beeches, locally known as 'The Beech Clumps.' The largest trees are the Spanish chestnuts, of which there are some exceptionally good specimens. There is also a particularly fine avenue of limes. In the coverts, the trees are nearly all oak; the underwood, consisting of hazel, horse-chestnut, ash, etc., is cut every ten years. The oak required for estate purposes is felled in the coverts where the underwood is due to be cut, and each year such gaps are filled by young trees raised in the nursery. A fair quantity of larch and Scotch fir are also raised in the nursery, transplanted, and finally used for estate fencing. The underwood has depreciated enormously in value since the abandonment of hop growing in the immediate neighbourhood.³

The park round Mereworth Castle, the seat of Viscount Falmouth, has an area of 124 acres; it is stocked with a herd of 105 fallow deer. The timber of the park is chiefly ash, beech, elm, and oak, with some Spanish and horse chestnuts; the beech trees are exceptionally fine. There has not been much planting on the estate of late years, though gaps in the park timber are always replaced. The greater part of the woodlands on this property has been used as underwood and cut periodically. At one time this was a fairly profitable trade, but it is now at a very low ebb owing to the change of training hops on wirework instead of on poles.⁴

The park of Surrenden Derring, near Ashford, on the estate of Sir Henry Nevill Derring, bart., incloses 260 acres; it is stocked with about 150 fallow and 50 Japanese deer. The park is very finely timbered. The underwoods on this estate are generally kept regularly planted up after the falls, which occur every year, the same land being felled at intervals of about twelve years. A small amount of ornamental planting is done occasionally, and a few acres of plantation, chiefly coniferous trees, have been recently laid out.⁵

The park of Boughton Place, near Maidstone, on the property of Mr. George Ryder, has an area of 75 acres, and now feeds a small herd of about 30 fallow deer. It is well timbered, and includes a wood of 3 acres which is chiefly beech and oak.

The Mote Park, Maidstone, the seat of Sir Marcus Samuel, bart., incloses about 560 acres, which is stocked with 150 fallow deer. The park is generally well wooded, and includes some fine forest timber, such as oak, elm, beech, and chestnut, as well as some choicer trees such as maple, silver elms, and tulip trees. There are also some of the finest black walnut trees in this country.

The park of Mersham Hatch, on the estate of Sir Wyndham Knatchbull, bart., in whose family it has remained since the days of Henry VIII, covers upwards of 400 acres and is stocked with about 150 fallow deer. It used to be appendant to the manor of Aldington, which was transferred to Henry VIII by Archbishop Cranmer.⁶

East Sutton Park, on the estate of Sir R. M. Filmer, bart., incloses about 100 acres of well-wooded land, including a few ancient forest trees; it is stocked with a herd of about 90 fallow deer.

Hall Place, Tonbridge (Mr. S. Hope Morley), stands in a well-wooded park of about 140 acres. The herd of fallow deer averages from 100 to 110. There is a good grove of beech and oak, but nothing noteworthy about the timber.

¹ From information kindly supplied by Mr. J. S. Goodwin, land steward.

² From information kindly supplied by Mr. E. C. Lister-Kay.

³ From information kindly contributed by Mr. G. F. Hodson, agent to the Earl of Guilford.

⁴ From information kindly supplied by Mr. James Horton, land steward to Lord Falmouth.

⁵ From information kindly communicated by Mr. Alfred J. Burrows, land agent.

⁶ Furley, *op. cit.* ii. 522-3.

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There are also many other parks in the county, all more or less well wooded and some of considerable extent where there are no deer.

The chief of these are Chevening Park, the seat of Earl Stanhope, which has an area of 850 acres, delightfully picturesque and beautifully wooded; Belmont Park, Lord Harris, 500 well-wooded acres; Fredville Park, of 300 acres, containing the celebrated old oak which has a girth of 35 ft.; Old Park, near Dover, 410 acres; Goddington Park, in Great Chart parish, which is well wooded and incloses 400 acres; Hothfield Park, Lord Hothfield, 350 well-watered and beautifully timbered acres; Linton Park, another well-wooded domain of 385 acres; Penshurst Park, undulating and containing some magnificent old timber, of about 350 acres; and Hole Park, Rolvenden, remarkably well wooded, and having an area of 260 acres. Other good parks of less size are those of Addington, Bedgebury, Betteshanger, Dawson, Holwood, Preston Hall, and Swifts, Cranbrook.

There are open commons with a good deal of brushwood and some larger timber at Hayes, Keston, West Wickham, and Tunbridge Wells.

Horsmonden is a parish celebrated for the luxuriant growth of its forest trees of oak, chestnut, elm, beech, and ash. Knockholt, on the high ground of the chalk plateau a few miles to the north-west of Sevenoaks, has a remarkably fine clump of old trees known as the Knockholt Beeches; they stand 770 ft. above the sea-level, and form a landmark for many miles around. Within the churchyard of Headcorn, one of the Weald parishes, is an immense oak of great age, having a girth of 40 ft.; it is looked upon as a relic of the ancient forest of Andred.

The attention given of late years to arboriculture and planting throughout England has brought about a most marked result. There is an increase in England's woodlands of about 200,000 acres in the last twenty years. In this happy result Kent has taken a considerable share, though the growth has been slight in the last decade. The woodland area of Kent, according to official returns, was 85,887 acres in 1888, but in 1891 the amount had grown to 96,333 acres. In 1895 the total had risen to 98,302 acres, and on June 4, 1905 (the last occasion on which a full return was made), the total had reached 98,871. Of this last total 75,820 acres are returned as coppice, that is woods that are cut over periodically and reproduce themselves naturally by stool shoots; 1,431 acres as plantations, that is planted or replanted within the last ten years; whilst the remainder, 21,620 acres, are entered as 'other woods.'

SPORT ANCIENT AND MODERN

HUNTING

FOX-HUNTING

THE first pack of hounds that we can trace as having hunted the northern part of Kent, between Canterbury and Maidstone, now known as the Tickham country, flourished during the early part of the last century, when Sir Edward Knatchbull kept a pack of foxhounds at Provender. This pack existed for many years under the name of the Provender Hunt, but what became of it or when it ceased to exist is not easy to discover. At a later period Lord Sondes had a pack of foxhounds at Lees Court, and after its dispersal Mr. S. R. Lushington hunted a pack under the name of The Lodge Hounds. Mr. Lushington's venture soon, however, came to an end, whereupon a fresh pack was got together by Mr. Pryce Lade, who acted as master for several years.

When Mr. Pryce Lade resigned the mastership of the hunt established by him, the pack was removed about the year 1825 to kennels near the hamlet of Tickham, after which place they were named, and ever since that time, the pack has been known as the Tickham Hunt.

Mr. William Rigden was apparently the first master of the hunt in its new home (although some of the records do not speak of him in that capacity until the year 1832); and with the help of a committee he looked after its fortunes for some time, eventually taking the whole management upon his own shoulders. Mr. Rigden continued in this position, with Giles Morgan as huntsman, until 1844, when owing to lack of funds and insufficient support, he gave up the pack, which meanwhile had become his own property, and sold it to Mr. Marriott, who at that time was hunting part of the Essex country.

The Tickham country was now without a pack; but Mr. Lushington again came to the rescue and started a fresh pack, with Temple and Thomas Tipton as his successive huntsmen. So matters continued until 1852, when Mr. Lushington resigned, and Mr. Rigden once more took up the reins of management with a fresh committee to assist him. Tipton continued in the capacity of huntsman, but in 1856 we find Mr. Rigden and Mr. Hall managing the hunt by themselves. Five years later Tipton, who had been an invaluable servant, severed his connexion with the Tickham, and took the position of huntsman to the South Berks, of which Mr. Hargreaves was then master. Mr. Philip Barling was thereupon appointed to the vacant position.

Once more, after a more or less prosperous period, the Tickham were in difficulties, and in 1865, again owing to lack of financial support and a lamentable scarcity of foxes, it was decided to break up the establishment, and advertisements appeared in the papers offering the hounds for sale. Before, however, a purchaser was forthcoming a fresh committee took upon themselves the task of trying to set the hunt on its legs once more, and Mr. Rigden consented to continue the mastership. In acknowledgement of his good endeavours the master was the recipient in 1868 of a testimonial, which took the form of a silver centre-piece for the table and was presented to him at a dinner held at Faversham 'in recognition of his services as a thorough sportsman.'

In the following year another change in the hunt establishment occurred, W. Fisher succeeding Mr. Barling as huntsman. Fisher only stayed one season and in 1870 was succeeded by J. Machin, who came from the Quorn.

A year later a terrible catastrophe occurred

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when Mr. Rigden, who was out cub-hunting in October, near Leeds Castle, was thrown from his horse which put its foot in a hidden ditch. The popular master, then in his eightieth year, was pitched upon his head, and was picked up quite dead with a broken neck. His mastership of the hunt had lasted, almost continuously, for a period of about 40 years, and Mr. Hall was elected in his stead. In 1872 Machin went as huntsman to the Pytchley, and was succeeded by Tom Hills, who came from the Cotswold country.

Mr. Hall's mastership only lasted until 1874, when he presented the hounds to Mr. William Edward Rigden, elder son of Mr. William Rigden; and Tom Drayton of the Warwickshire began as huntsman to the new master. This arrangement lasted for a couple of seasons, when Mr. Rigden decided to carry the horn himself with J. Ford as whipper-in and Tom Pedley as second whip. Ford left in 1878, and W. Burton, first whip to Lord Middleton, took his place. The latter only stayed for a season, returning to Lord Middleton to act as huntsman; and Pedley was thereupon promoted to first whip with R. Jay to act as his second.

Meanwhile Mr. Rigden was concentrating his attention on improving the pack, and made purchases at several sales, notably at those of Mr. Musters, the Honourable Mark Rolle, and Mr. Arkwright of the North Herefordshire. He also secured a young draft from the Duke of Grafton's, and in time had a first-class lot of working hounds. As years went on he maintained the standard of the pack by the use of sires from the Duke of Grafton's, the Fitzwilliam, Mr. Fenwick's, and Lord Guilford's kennels at Waldershare.

It was a great difficulty in those days to get puppies put out to walk, and Mr. Rigden had some trouble in disposing of his ten or twelve couples every season; but at length by offering prizes for the three best dogs at an annual show, he managed to increase his puppies at walk until at last he often had out as many as thirty to forty couples. Mr. John Rigden, the master's brother, also gave a prize for the best couple of walked puppies. Some fifty farmers used to attend the annual puppy show, and the lunch afterwards was always a merry function with a merry sportsman at the head of it.

In 1877 Mr. Rigden purchased twelve acres of land at Wren's Hill, for the erection of new kennels and stables, for by this time the accommodation at the old kennels had become outgrown. The master was his own architect, and the new stables were built to accommodate twenty hunters.

Mr. William Edward Rigden completed his twenty-one years of mastership in 1895, and the hunt, by way of commemorating the event, presented him in November of that year, with a cleverly executed hunting picture, the work of Mr. Heywood Hardy. The painting represented the master mounted on his favourite hunter Battledore, leaving covert with his hounds. The presentation was made at a dinner held at the Faversham Drill Hall, at which Lord Harris presided. Mr. Rigden's speech in acknowledgement of the gift began with the following characteristic and pretty little anecdote: 'The other day,' said the master, 'as I was out hunting, a very favourite hound got his leg in a rabbit wire and was moaning with pain. I jumped down and released him, and he kept quiet, letting me do just what I liked, and when I had done he gave a yelp of delight, and jumped up and licked my face. I only wish I knew of something I could do as eloquent, as brief, and as convincing as the action of that hound was, so that I could show my gratitude to you.'

Seven years later, on the occasion of his marriage in December 1902 with Miss Jessie Moray Brown, the members of the hunt made Mr. Rigden a present of a silver tea and coffee service as a further mark of their esteem, and Mrs. Rigden was the recipient of a diamond brooch.

On 26 September 1904, at the end of thirty years' mastership, Mr. Rigden died somewhat suddenly of blood-poisoning at the age of 61. With the exception of one or two minor breaks and the few years between Mr. William Rigden senior's death and the time when his son took over the pack from Mr. Hall, father and son between them had hunted the pack for a period of nearly eighty years. At the time of Mr. W. E. Rigden's death there were fifty couples of hounds in kennel, and another forty couples out at walk.

Never was there a straighter rider than Mr. William Edward Rigden, nor a master who knew the capabilities of horse or hound better than he did. During his long reign he placed the hunt on a secure foundation and made himself popular wherever he went. He had to contend with many difficulties, and shooting interests clashed with his own on more than one occasion. But he was a man who could retire gracefully as well as go forward, and there was not a soul in the country with whom he had ever come in contact but was sincerely grieved at the loss of so good a master and so excellent a sportsman in and out of the saddle.

There is one little anecdote told of him

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which is worthy of record. It is said of him that he killed his first Tickham fox at Tong on the farm belonging to Mr. T. Bensted, the 'Father' of the hunt, and that he made it a practice of going to Tong for his first fox of the year in each succeeding season. Further than this he is credited with having killed an early season fox, if not the very first, within the parish during every year of his mastership.

On Mr. Rigden's death the hunt committee, with Lord Harris as chairman, met—for the first time in twenty years—at the Bull Hotel at Sittingbourne, and accepted the offer of Mrs. Rigden to lend the horses and hounds to the country for the season. Mr. George P. Elystan Evans, late master of the Cambridgeshire, was asked to accept the mastership, which he agreed to do in conjunction with Mrs. Rigden. Since that time the Tickham Hunt has been carried on under that arrangement, a guarantee of some £1,600 to £1,800 per annum being made towards the expenses of maintenance.

Latterly, there have been resignations and rumours of resignations, but up till 1907 no definite change in the establishment of the Tickham Hunt has been made. At the last meeting of the committee, on 4 December 1906, the joint masters tendered their resignation for the second or third time, and a resolution was carried asking them to reconsider their decision.

When Mr. Evans took over the Tickham pack he found it one of the best in the kingdom, and so it has been maintained up to the present time. The pack is full of Belvoir and Warwickshire blood, with characteristic features of good back ribs, shapely necks and broad powerful shoulders. Much of the good blood in the kennel is due to the influence of that good sire Nestor,¹ whose

progeny are to be met with in many other noted kennels.

At the present time the Tickham Hunt possesses fifty couples of hounds, which Mr. Evans hunts himself. They meet three times a week. The country hunted is about twenty-five miles from east to west, by fifteen miles from north to south, and on the west the West Kent territory forms the boundary. On the east the East Kent country is touched, and on the south that of the East Sussex, together with a large area of land that is not hunted by any pack of foxhounds. Plough-land is chiefly met with, as well as a considerable tract of large woods, but pasture is on the increase nearly everywhere. There is plenty of jumping of a moderately stiff order, and wire is plentiful, but possible of negotiation at marked places. Most of the country is hilly, and a fast, stout horse is the best.

Fox hunting was pursued in the eastern portion of Kent probably quite as early as in any other part of the county, but nothing in the way of reliable record can be discovered previous to the time of Sir Henry Oxenden of Broome Park, seventh baronet, the possessor of a noted pack of 'spayed' bitches, with which he hunted the country until about 1828. He was succeeded by Sir Brook William Bridges of Goodnestone, fifth baronet (afterwards Lord Fitz-Walter of Woodham Walter), and later by Mr. William Deedes of Sandling Park, who carried on the pack until 1832.

At the expiration of Mr. Deedes' mastership Mr. James Drake Brockman of Beachborough, of whom it may be said that he was the real founder of the East Kent Hunt, came into power, and controlled the country for no fewer than thirty-eight years.

Mr. Brockman's period of mastership began at a time of many difficulties; but after several disappointments and some opposition, he succeeded in overcoming the prejudice against fox-hunting that existed in some quarters, and popularized the sport among the tenant farmers of that part of the county. At the same time he concentrated his attention upon the formation of a really sound pack, and finding foxes rather scarce, went to the trouble of importing some from across the Channel. The interests of game-preserving in this part of Kent were being more and more jealously guarded every year during Mr. Brockman's mastership, but so tactful was he that foxes soon began to flourish and blank days became fewer every season.

A good story is told of Mr. Brockman in Sir Humphrey de Trafford's magnificent

¹ Sir Humphrey F. de Trafford, bart., *The Foxhounds of Great Britain and Ireland*, 1906.

Nestor's pedigree is as under:—

NESTOR, 1900			
Warwickshire Nailer, 1894	Belvoir Nominal, 1888	Gambler, 1884	Weathergage, 1876
		Needy, 1884	Gratitude, 1880
	Huntress, 1888	Harper, 1885	Syntax, 1880
		Frailty, 1880	Needful, 1877
Stella, 1893	Gambler, 1884	Milton Solomon, 1879	Handsome, 1882
		Belvoir Fallibly, 1874	Belvoir Falibly, 1874
		Roy, 1877	Gratitude, 1880
	Guides, 1890	Belvoir Game-boy, 1884	Oakley Render, 1883
		Anxious, 1886	Oakley Angry, 1879
		Milton Somerset, 1883	Selim, 1878
Songstress, 1888	Rhapsody, 1881	Senseless, 1879	Striver, 1875
		Rival, 1879	

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volume.¹ One day, while out cubbing, one of the field who did not know the master—the latter not being dressed exactly in hunting costume—mistook Mr. Brockman for one of the hunt servants and offered him five shillings to put hounds on to an old dog-fox that Mr. Brockman himself had just viewed away. We are not told whether the bribe was accepted.

Mr. Brockman's popularity may be gauged from the fact that some of the farmers in his district paid him subscriptions amounting to as much as £100 at a time; and the esteem with which he was regarded is further evidenced by the presentation to him in 1866 of a portrait of himself by Stephen Pearce which still hangs at Beachborough House. The inscription underneath the picture runs:—'Presented by the members of the E.K.H. and other friends as a mark of respect and esteem to Frederick Brockman, Esq., who for thirty-three successive seasons has hunted the East Kent country.'

Four years later Mr. Brockman was obliged, owing to failing health, to end his long and remarkable reign, when another testimonial, this time in the form of a valuable gift of plate, was presented to him.

The East Kent now entered upon a still more prosperous era, when Dudley Francis, seventh Earl of Guilford, whose name was well known in connexion with racing, and indeed with every form of sport, began his nine years' mastership. This was in 1870, and he began at once to hunt the country in lavish style four days a week. His lordship's most generous act was to build new kennels and stables at Waldershare at a cost of some £30,000.

Foxes were not very plentiful, but Lord Guilford was a keen man to hounds and it was said of him that he could find a fox when nobody else could. He showed good sport until 1879 when his control of the pack ceased, and it was a sad day² when he met with his death in Dorset after a fall while hunting.

Mr. F. J. Mackenzie succeeded the Earl of Guilford as master, but only stayed a season or so, and Mr. W. H. White, whose tenure of office was equally short, came in 1881 and went in 1882. The next master was Mr. E. R. Sworder, who stayed with the pack for seven years. During his mastership he nearly lost his life through the earth falling

in upon him while he was digging out a badger, and it is said that he never really recovered from the effects of that accident. He left the East Kent in 1889 and went to the Hertfordshire, of which he was master for ten or eleven seasons.

The next master of the East Kent was Captain F. Fitzroy, who died at the end of his first season. Foxes were still scarce even at this date, but Captain Fitzroy showed good sport with what there were; and his sad death, coming at the end of a long run of bad luck and a series of vicissitudes for the pack, cast a feeling of gloom over the whole country.

Mr. C. W. Prescott Westcar came next, in 1890, and stayed till 1893. He was followed by Mr. A. B. Worthington (1893–1894), and Mr. L. E. Bligh, who stayed till 1898, when he left to hunt the Minehead Harriers. He was succeeded by Mr. Wilfred Baker White, who controlled the destinies of the hunt till 1900, when the present master, Mr. William Selby-Lowndes, took hold. Mr. White went to the West Kent, with whom he stayed till 1904.

The present master came from the Bilsdale pack, where he had been for three seasons. His father was master of the Whaddon Chase, which pack has been hunted by the Selby-Lowndes family since the end of the eighteenth century. The present master of the East Kent began with a pack of harriers at the age of thirteen, and afterwards went to America, where he hunted the fox for two years.

Since Mr. Selby-Lowndes came to the East Kent the quality of the sport has been much improved. Foxes are more plentiful, and a good feeling prevails between shooting and hunting men as well as among the farmers. During his first five years of mastership Mr. Lowndes accounted for 67½ brace of foxes, a tally which beats all previous East Kent records.³ The pack is now forty-five couples strong, and contains Belvoir, Grafton, and Warwickshire blood.

Hounds meet four times a week. The country is about twenty-four miles in length by eighteen miles from north to south, and extends from the Tickham boundary on the north-west to the sea on the south and east. About half of the area is plough, with plenty of grass and downland, and a little jumping of ditches and fences in the lowlands. A few of the fences in other parts of the country are somewhat stiff. The best part of the low country is the Ashford Vale. A sum

¹ Trafford, *The Foxhounds of Great Britain and Ireland*, 146.

² On 19 December 1885. He was then master of the Cattistock.

³ *Foxhounds of Great Britain and Ireland*, 147.

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of £1,100 per annum is guaranteed the master, together with kennels, stables, and hunt servants' cottages rent free, and a poultry fund.

In that part of Kent which is now adjacent to London or actually part of it, two or three packs of hounds existed in early times. During the last decade of the eighteenth century there was fox-hunting in the Bromley portion of the county, and there was another pack which was kennelled at Sydenham, and hunted what we might now call the Crystal Palace side of the country. On the Bromley side Sir John Dixon Dyke of Horeham, baronet, held sway in the last quarter of the eighteenth century, and was succeeded by other members of the same family, who are credited with having hunted the country up till about the year 1830, at which period the name of the West Kent Hunt first appears.

It would seem, however, that Sir John Dyke's pack was actually given up some time before this, for his eldest son, Sir Thomas Dyke, fourth baronet, is spoken of¹ as having started a fresh pack of dwarf hounds about this period, his custom being to hunt fox in the spring, and hare during the earlier part of the season. After Sir Thomas Dyke came his brother Sir Percival Hart Dyke, fifth baronet. It appears, therefore, that not only had Sir John Dyke's pack been dispersed, but also that of Sir Thomas. Sir Percival gave up his pack in or about the year 1834, Richard Hills having acted as huntsman both to him and to Sir Thomas.

These are some of the names connected with hunting in West Kent up to about the time when the present hunt began to be known by its existing title; but fox-hunting in Kent had existed long before the establishment of the Bromley pack, and one lot of hounds at least went farther afield than either of the packs kennelled at Bromley or Sydenham.

This was the old-established hunt founded by the famous John Warde² of Squerries, who had kennels at Westerham in the year 1776. No one else seems to have had a share of the West Kent country at this time, and Mr. John Warde hunted the whole of it up to

1793, at which time, as already mentioned, packs were established, or in being, at Bromley and Sydenham.

When Sir Percival Dyke's connexion with the country came to an end in 1834, a Mr. Waring, who then kept a pack of harriers in the district, bought some of his foxhounds and hunted both fox and hare for a few seasons. About the year 1836 Mr. Forrest appeared upon the scene and established kennels with a fresh pack of hounds at Greenhithe, and here it would seem that the West Kent began a new lease of life about which particulars are almost entirely wanting. What became of Mr. Waring's pack nobody knows, and it is doubtful whether his hunt could properly be called the West Kent at all.

Mr. Forrest apparently hunted hounds until 1844, although no details of his mastership are to be discovered, and the next authentic master of whom we hear is Mr. Tom Colyer, who founded yet another pack with kennels at Milton near Gravesend.

Mr. Colyer's term of office lasted until 1856, when without any previous warning or for any apparent reason he disappeared in the middle of the season, and was never seen again. During his mastership he had done a great deal for the country, and had established a good pack by purchases from the kennels of Mr. Selby-Lowndes, of the Whaddon Chase, and from Sir Richard Sutton's pack. He always hunted hounds himself and showed some really good sport, although he did not by any means hunt the whole of the available country. His foxes are said to have had a particular affection for Surrey and many of his best runs were in that direction from the Pol Hill coverts.

On Mr. Colyer's sudden disappearance the Honourable Ralph Pelham Nevill, of whom we shall hear again presently, took over the pack for the remainder of the season, and thus saved the hunt from a remarkably awkward situation. At the end of the season Mr. Colyer's pack was put up to auction, part of it being bought by Mr. Armstrong and Mr. Wingfield Stratford, and the remainder sold to Mr. Tailby. New kennels were built at Betsham, Southfleet, where Mr. Armstrong lived, and drafts were purchased from Mr. Nun's, Mr. Cawston's, and the Oakley kennels.

Mr. Armstrong and Mr. Stratford hunted the country as joint masters for a season or so, when the latter retired, and a year later, in 1858, Mr. Armstrong sold his hounds, which meanwhile had been supplemented by a draft from Mr. Farquharson's.

Mr. Wingfield Stratford now purchased

¹ *Foxhounds of Great Britain and Ireland.*

² John Warde's name is, of course, famous in many hunting circles outside Kent, for in 1797 we find him with the Pytchley, where he remained until 1808, and with the New Forest from the latter year to 1814. Afterwards he went to the Craven, and stayed with them until 1825, so that altogether he was a master of hounds for half a century, with only one break of four seasons.

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about fifteen couples of Mr. Armstrong's hounds, the rest of which were secured by Mr. Arthur Whieldon, of the Vine; and having built new kennels at Wrotham Heath, close to his residence at Addington Park, he continued to preside over the destinies of the hunt until 1862, when the Honourable R. P. Nevill of Birling Manor, second son of William, fourth Earl of Abergavenny, joined him. Two years later Mr. Stratford withdrew, and Mr. Nevill continued alone.

To Mr. Ralph Nevill, than whom no better man with hounds ever existed, must be given the credit of having set the West Kent upon the firm footing which it has enjoyed ever since his day. To George Bollen, too, a capable huntsman, who was with Mr. Nevill for a dozen years or more, must also be awarded some acknowledgement of the good work done and the good sport shown during that long period, while another good huntsman, Tom Hills of the Burstow, a son of Tom Hills of the Old Surrey, must also be mentioned.

The West Kent never had a more popular, or a more capable master than Mr. Nevill, and the farmers of the country showed their appreciation of his worth by presenting him in 1892, soon after his retirement, with a portrait of himself seated upon a favourite grey with some of his pack around him. The picture, the work of John Emms, hangs at Birling Manor, Mr. Nevill's seat in Kent. Mr. Nevill had previously (at the end of his seventh season) been the recipient of a piece of plate, presented by members of the hunt. His mastership of the pack lasted from 1862 to 1891.

It was during the early years of Mr. Nevill's mastership that the West Kent had that good sportsman, Mr. Richard Russell of Otford Castle, familiarly known as 'Dick of Otford,' as secretary of the hunt. After he had reached the age of seventy Mr. Russell was taken seriously ill, and his life was despaired of. The occasion prompted Mr. Nevill to pen some spirited verses, of which two stanzas run as follows:—

Then fill up your glasses, for ne'er shall we see
At Otford a sportsman so thorough as he;
Be it fox, be it stag, a drag or a hare,
Whatever the chase he was bound to be there.

Then fill up your glasses, and drink, my boys, drink,
Long life to Old Richard, nor e'er let us think
His days are yet numbered, though sixty and ten
Is the limit of summers allotted to men.

'Dick of Otford' got better, and the wish of his impromptu bard was gratified. Another wish, Mr. Russell's this time, was

that a piece of ground might be consecrated in the wood at the top of the hill at Otford, and that he might be buried there, so that when hounds or fox came by they might pass near his grave. But this hope of the old sportsman was never gratified, and he lies buried in the churchyard at Sevenoaks.

In 1891 Colonel Warde, who was then member of Parliament for the Mid-Kent division, became master of the West Kent, and was succeeded in the following year by Mr. R. Stewart-Saville. The latter stayed till 1895 when Lord George Montacute Nevill, third son of William, first Marquess of Abergavenny and a nephew of Mr. Ralph Nevill, came from the Eridge, of which hunt he had been master from 1880 to 1887, and taking over the hunt, continued with it till 1900.

George Bollen, Mr. Nevill's old huntsman, had remained with each successive master, but in 1896 he was succeeded by Eli Skinner, who came from the Worcestershire; and later by Wesley, of the Old Surrey. George Bollen returned to his old post after a lapse of two or three seasons, but left again in 1901 during the mastership of Mr. W. Baker White, who came from the East Kent in 1900, when Tom Darch, from the Essex, took Bollen's place as huntsman.

Mr. Baker White stayed with the West Kent until 1904, when the present master, Mr. William Gore Lambarde of Bradbourne Hall, succeeded him.

The country hunted by the West Kent comprises an area about seventeen miles square, apart from the territory recently occupied by the Hundred of Hoo Hunt. This part of the county was formerly regarded as belonging to the West Kent, but it was given up about the year 1896 as unmanageable under the existing establishment of that hunt. On the west the Old Surrey country marks the boundary; the Burstow and Eridge are to the south; and the Tickham to the east. The country is chiefly pasture with a fair proportion of woodland, but very little plough, and there is not much wire. Some forty-five couples of hounds constitute the pack, which is kennelled at Otford near Sevenoaks.

The Hundred of Hoo Hunt no longer exists. It was established in 1896 to hunt that part of the country vacated by the West Kent, and Mr. Whitebread, who was the instigator of the movement, got a scratch pack together for the purpose. He himself acted as master until 1900, when he was succeeded by Mr. H. Gibson, who stayed two years.

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Mr. P. G. Barthropp came next and continued till 1902, when Mr. Lake and Mr. Arcoll became joint masters. At the end of the 1904-5 season the arrangement came to an end, the hounds being sold at Rugby in May 1905. The Hundred of Hoo country is therefore still vacant and seems likely to remain so unless the West Kent pack reverts to the old order of things once more.

STAGHOUNDS

The earliest form of the chase adopted in Kent, as elsewhere in the once thickly wooded parts of England, was stag-hunting. This, of course, is only natural, for the country was ready made for it, whereas for hare-hunting or fox-hunting there was far too much wood until the slow march of civilization began to leave its mark in the numerous spaces cleared for the cultivation of crops.

Several references to South of England stag-hunting in the thirteenth century are to be discovered, and from them one gathers that in those early days the chase was chiefly in favour with the clergy. Henry III seems to have been particularly gracious in granting leave to notable divines to hunt in the royal forests, and, if all we read is true, the privilege was very much abused. Hunting was certainly not nearly as popular with the masses then as it is to-day for many reasons, and it was urged against the clergy in particular that they became so intoxicated with the delights of the chase that they did practically nothing except hunt. Thus we read that Walter de Merton, Bishop of Rochester (1274-1277) devoted his life to stag-hunting, and, according to Strutt, was an 'an excellent hunter, but so fond of the sport that at the age of fourscore he made hunting his sole employment, to the total neglect of the duties of his office.'

An even earlier reference to stag-hunting in Kent is to be found in a paper contributed to the *Sporting Magazine* for January 1793 under the head of 'A curious Account of the Sports and Pastimes of the Londoners in the reign of Henry II, by William Fitzstephen, a Monk.' After an elaborate account of the various holiday sports of the period, the writer concludes:—

Many citizens take delight in birds, as sparrows and hawks, goshawks, and such like; and in dogs to hunt in the woody grounds. The citizens have authority to hunt in Middlesex, Hertfordshire, all the Chilterns, and in Kent, as far as Grays-water.

In Kent, as elsewhere, the earlier methods of stag-hunting were of a very rough-and-ready character, and the hounds employed

must have been very rough-and-ready too. Nearly every squire in the early part of the eighteenth century, when hunting seems to have come generally into favour with every one, had his three or four couple of hounds with which he used to hunt anything that he could find—stag, fox, or hare. Sometimes these odd couples belonging to different owners would combine, and thus, no doubt, began the custom of kennelling hounds on the 'trencher-fed' system, which still exists in several parts of England. Probably there were dozens of packs in every county conducted on these lines, but none of them, of course, was organized in the same way as at present.

A rather gruesome reference to one of these establishments is made in an issue of the *Sporting Magazine* in 1793. The account says that 'while the hounds of—— Gordon, Esq., were hunting in Whitley Shrubbs near Seven Oaks in Kent, a hound was perceived with a human head in his mouth, which was proved once to have belonged to a boy lost from the workhouse at Beresford in October last, and who was then advertised, but has not since been heard of.'

Sometime about the middle of the last century the Dering family is said to have kept a pack of staghounds for a short time at Surrenden Park, Pluckley, now the residence of Mr. Walter Winans, well known as the owner of many famous trotting horses. But the only Kentish pack of note established on sound lines is the Mid-Kent, which has now been in existence for nearly forty years.

THE MID-KENT STAGHOUNDS

These notable hounds were started as a private pack in the year 1868 by Mr. Tom Rigg and were hunted by him until 1874. At that time the Mid-Kent became a subscription pack and they have been carried on in that way up to the present time.

When Mr. Rigg gave up the mastership of the Mid-Kent that office went to Mr. Ambrose Warde of Tutsham Hall, but he only remained a single season with the pack, and was succeeded in 1875 by Mr. Charles Frederick Leney of Thorndale. Mr. Leney, whose kinsfolk have been a good deal associated with the Mid-Kent for a period of more than thirty years, stayed till 1883, when another member of the family, Mr. Herbert Leney of Blacklands, took over the reins of management. This arrangement lasted for three seasons, the next master being Mr. R. A. Barkley of the Priory, Diss. He held office till 1888, in which year the late Colonel J. T. North of Eltham came upon the scene.

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Colonel North's mastership lasted for four seasons, his successor being Mr. George P. Russell of South Darenth, who stayed with the pack until 1894. In the latter year Mr. Augustus Leney of Orpines took over the management, and he still (1907) holds that position. Mr. Leney is his own huntsman, with Will Welch to turn hounds to him, and John Wilcox as kennel huntsman. Mr. Richard Tapply of Thorndale is the honorary secretary.

The country hunted by the Mid-Kent Staghounds lies entirely within Kent, and extends over an area some forty miles square in the eastern and middle divisions of the county. There is very little plough, the nature of the open country being principally pasture. Woodland is, however, distributed more or less all over the territory of the hunt, and some of the coverts are of considerable size. Wire, which in past times caused a good deal of trouble, is now well marked where it is still left standing, and arrangements are made for its removal in some districts.

The establishment of the pack is twenty couples of hounds, which are kennelled at Wateringbury; and twenty-five deer are kept in paddock, the latter being under the care of H. Ralph at East Malling Heath. Days of meeting are two a week.

The Surrey Staghounds, which, of course, belong properly to the county from which they take their name, also come into the western part of Kent on occasion.

HARRIERS

A county possessing so much open country as one meets with in Kent, whose breezy marshes and expansive uplands provide that seclusion so beloved of the hare, is certain to be well supplied with packs of harriers and beagles. Before the Ground Game Act of 1881 came into force, the hare in Kent was considered the perquisite rather of the courser and the hunter than of the gunner, but although that act has had the effect of reducing the ground game in many parts of the county, hares have been sufficiently well preserved by large landowners and tenants to be still plentiful enough both for hunting and coursing. At the present time there are at least seven packs of harriers within the county, and three or four packs of foot harriers or beagles. The latter are mostly of recent origin, the Fordcombe pack, established about the year 1870, being the oldest of those now in existence. Several packs have disappeared, chief

among them being the Boxley (Mr. Brassey's Harriers), which hunted a portion of the territory now controlled by Mr. Mercer's pack in the Sittingbourne district, and the Fox Bush Harriers, which were merged in the Hadlow Foot Harriers in 1903. The names of many of the existing packs have been changed from time to time.

Mention is made of the existence of a pack of harriers in the Sandhurst district so far back as the seventeenth century, but it is doubtful whether they can claim to be in any way related to the present establishment. The Collins family appears to have controlled a trencher-fed pack at that period, and carried it on till 1847. From that date until 1868 Messrs. Robert Dunk and Edward Collins held the joint mastership, when Mr. Braizier of Old Place, Sandhurst, came into office, continuing till 1878. At this period there comes a break in the pack's history, the hounds being sold by auction, the majority of them finding their way into the kennels of neighbouring establishments. For some years the district remained unhunted, but eventually Mr. Edward Collins formed a fresh pack with kennels, as before, at the Crouch, and George Jenner as huntsman. Mr. Thomas Collins afterwards succeeded to the mastership, and the kennels were removed by him to Benenden, but he still hunted the Sandhurst country. Subsequently the kennels were once more removed, this time to Spills Hill, Staplehurst, where the hounds were established under the name of the Weald of Kent Harriers, with George Jenner still acting as huntsman. The Sandhurst district was now again without hounds until 1895 Mr. James Farley of Ticehurst bought the pack and re-established it under the name of the Ticehurst Harriers. For a couple of seasons he hunted the Sandhurst country from Ticehurst with Joe Relf as kennel huntsman, but in 1897 he removed his kennels to Boxhurst, Sandhurst, with George Jenner as huntsman. Up till 1902 Mr. Farley carried on the pack at his own expense, when Mr. Le Breton Simmons, of Chippenham, Wilts, joined him in the mastership. The latter carried the horn, Jenner taking the place of kennel huntsman. In the following year Mr. Farley retired, and the pack was hunted by subscription with Mr. Simmons as master. A committee took over the management in 1904, hounds and kennels being lent by Mr. Farley. Mr. H. A. Pratt of Rolvenden was chosen as deputy-master, with George Jenner again as huntsman. In 1907 Mr. Farley resumed the mastership. During the time that Jenner has been with the pack they have

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killed as many as sixty-five brace of hares in the season. From time to time some of the best of the old southern hound blood has been brought into the kennel, notably from the Penistone, the Holcombe, the Stanington, and the Bexhill packs. The kennels are at Boxhurst Farm, Sandhurst, and the pack, consisting of fifteen couples of southern harriers, 23 inches in height, meets twice a week. The country hunted lies in the Weald of Kent, and consists of pasture, plough and woodland in about equal proportions. There is very little wire.

A large tract of country is hunted by the Ashford Valley Harriers whose territory extends for some twenty miles from east to west, by about twelve miles from north to south. This area consists for the most part of grass, with a small proportion of woodland and plough. It is a fair scenting country and has some good hunting fences, but wire, unfortunately, has greatly increased of recent years, and most of it remains up throughout the hunting season. The master, Mr. John C. Buckland, of Goldwell, Great Chart, Ashford, hunts the pack, which is his own property, at his personal expense, and carries the horn. The pack is old established and was hunted from about 1860 to 1878 by Mr. Alfred Swaffer, who was succeeded in the latter year by the present master. The kennels are at Goldwell, about three miles from Ashford. Mr. Buckland's pack consists of twenty couples of 20-inch hounds, a cross between southern harriers and dwarf foxhounds.

The West Kent Harriers are a subscription pack with kennels at Lamorbey Park, Sidcup, where the master, Mr. Lewis P. Kekewich, who has held office since 1905, resides. Former masters of the West Kent have been Mr. Henry Lubbock, Mr. William May, Mr. Richard Foster, jun., and Mr. Cecil Berens. The country lies partly in Kent and partly in Surrey, and about one-half of it consists of pasture. There are some good fences with plenty of galloping. The pack consists of fifteen couples of 20-inch dwarf foxhounds, and meets twice a week.

Mr. Mercer's Harriers were established in 1903, when they succeeded a pack of beagles hunted by the same master during the three previous seasons. The country extends from Faversham on the east to Rainham on the west, and from the Swale on the north to a point about seven miles to the southward. The Boxley Harriers, otherwise known as Mr. Brassey's, formerly hunted part of this district with some of the surrounding country. About one-half

of Mr. Mercer's territory is plough, and the remainder consists partly of woodland, and partly of marsh intercepted by large dykes. The latter is very good scenting country and affords the best sport. Except in the marshland, where there is not much fencing, wire is somewhat plentiful. Twenty couples of 20-inch harriers constitute the pack, whose kennels are at Rodmersham near Sittingbourne, where the master resides. Mr. J. Strouts acts as huntsman.

The Romney Marsh Harriers are among the old established packs of the county and began their career about the year 1858. The pack is at present managed by a committee, with Major H. Finn (Elm Grove, Lydd, Kent) as honorary secretary. Former masters have been:—Mr. Albert Cock, Appledore (from about 1858 to 1866), Mr. Alured Denne, Lydd (1866 to 1868), Mr. W. D. Walker, New Romney (1868 to 1892), Mr. P. G. Barthropp (1892 to 1893), Messrs. R. P. Burra and J. S. Vidler (1893 to 1894), Mr. R. P. Burra (1894 to 1895), Messrs. R. Kenward and J. F. Selmes (1895 to 1896), Colonel H. C. Wilson (1896 to 1899), Mr. Frank Green (1899 to 1901), Mr. T. Bayden (1901 to 1903), Colonel H. C. Wilson (1903 to 1904), Mr. J. F. Selmes (1904 to 1905), and Mr. Frank Green (1905 to 1906).¹ The pack consists of twenty couples of bitches, 20 to 21 inches, all foxhounds; the kennels are at Brookland; and meets are held twice a week. Most of the country hunted by the Romney Marsh Harriers lies in Kent, but their territory extends into Sussex. The country is chiefly pasture and there is very little wire.

As early as 1760 Mr. Farrer of Cleve Court kept hounds in the Isle of Thanet. These were undoubtedly used for hare-hunting, though we find an account in the *Kentish Gazette* of 27 September 1769, of a hunt after a deer, which was a run with Farrer's hounds. In 1791 an advertisement appeared in the *Kentish Gazette* for a huntsman, but no record of the appointment is extant. The Isle of Thanet Hunt as it now exists was established on 2 April 1813, at a meeting held at the Mount Pleasant Inn near Minster, where Messrs. Ambrose Collard, John Swinford and Henry Collard were appointed stewards, and Thomas Oakley Curling secretary. The hunt has been carried on in the Isle of Thanet continuously from that date. In 1849 Mr. John White took the country and built new kennels at Brooksend, moving the hounds thither from Hoo Corner, Monkton; and

¹ *Baily's Hunting Directory*, 1906-7.

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he hunted the country till 1873. The pack was known as the Brooksend and Isle of Thanet Harriers, and was made up of 20 to 21-inch harriers and dwarf foxhounds. Captain Tomlin succeeded Mr. White in 1873, the latter still carrying the horn. In 1875 Captain Cotton became master with Mr. J. White as huntsman, the pack being known as the Thanet Harriers. Then in 1877 came Mr. Graham Lloyd, who hunted the pack himself, followed by Mr. Johnson in 1878. The latter only remained two seasons. In 1880 Messrs. H. S. Russell and W. P. Cosier assumed the duties of joint masters for two seasons, with Mr. John White again as huntsman. Two years later Mr. E. F. Davis took the country, with Mr. Ambrose Collard junior as huntsman. Mr. Davis was followed in 1884 by Mr. J. Chesshyre, who carried the horn himself, and in 1885 by Mr. Vincent Frisby, with Mr. W. N. F. Parsons as huntsman. Mr. Frisby moved hounds from Brooksend Kennels to Walter's Hall, Monkton. On Mr. Frisby retiring in 1887 a committee carried on the hunt for three seasons, with Mr. Ambrose Collard as huntsman. The pack was moved back to Hoo Corner, Minster, where they had been from 1840 to 1849, to kennels lent to the country by the Marquess Conyngham. The pack then consisted of fifteen couples of 18 to 19-inch harriers. In 1890 the Right Honourable James Lowther, M.P. for the Thanet Division, became honorary master, Mr. Ambrose Collard retaining the horn, and Colonel Copeland assumed the duties of honorary secretary. This rule continued unbroken for eight seasons, but the name of the pack was in 1895 changed to the Thanet and Herne Harriers. In 1898 Mr. Collingwood Ingram was master and hunted the country with 20-inch dwarf foxhounds, being succeeded in 1900 by Dr. Kelly Paterson, who only remained one season. Mr. Ambrose Collard carried the horn with both the last masters. Lord Decies, who assumed the mastership in 1901, carried the horn himself, with Mr. Ambrose Collard as honorary secretary. He bought the pack from a committee and established his own hounds, which were 20 to 22-inch foxhound bitches. When he retired in 1905 Lord Decies sold the pack to Mr. B. Prescott-Westcar, who moved the kennels from Monkton to Strode Park, Herne, and is now (1907) hunting the country. In 1905 Mr. Ambrose Collard resigned the secretaryship, after having been associated with the pack for about fifty years, and was succeeded by Mr. Cooper Wachter as honorary secretary.

The Thanet and Herne country includes the whole of the Isle of Thanet and the district of Herne as far as Whitstable. In the former neighbourhood there is a large proportion of woodland, but the rest of the territory consisted, until recent years, principally of plough. Latterly a large part of this has been laid down to grass. Wire is somewhat plentiful, but it is well marked, and during the season most of it is removed by arrangement. The pack hunts as far south as the Canterbury and Sandwich Road. It consists of eighteen couples of bitch foxhounds and five couples of harriers, and meets on two or three days a week.

The West Street Harriers were established at Worth, and subsequently took up their quarters at West Street in East Kent in 1843. In that year Mr. Michael Nethersole took possession of the pack and hunted it at his own expense up to the year 1869, when it became a subscription pack. Granville George, second Earl Granville, was master from 1875 to 1887, and Mr. R. Coleman from 1888 to 1897. He was succeeded in the following year by the Earl of Guilford, who held the reins of management until 1901. In 1902 Mr. J. E. Allen and Mr. A. French Blake held the joint mastership for a season, and from 1903 to 1905 Mr. Allen was master. Mr. A. French Blake of Eythorne near Dover is the present master, and hunts the pack for a committee. The pack consists of seventeen couples of dwarf bitch foxhounds, and the kennels are at Waldershare Park. Meeting days are twice a week, with occasional by-days. The West Street Harriers' territory consists chiefly of arable land with a proportion of down country. There are few jumping fences, but wire is somewhat prevalent. The country is bounded on the east by the coast-line between Dover and Sandwich, and on the north by the Isle of Thanet. The road from Dover to Canterbury marks the limit on the southern and western sides of the territory.

POINT-TO-POINT RACING

Point-to-point meetings are now regularly held in connexion with the three chief hunts in the county, viz., the East Kent, West Kent, and Mid-Kent Staghounds. The Tickham Hunt also promotes an occasional meeting. During the spring, too, the officers stationed at the various garrisons hold similar gatherings, the Chatham garrison usually having their meeting at Higham. In 1906 the Grenadier and Coldstream Guards carried out their programme at Goddington, whilst in 1907

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the 7th Dragoon Guards selected a course at Brook, near Wye; the Shorncliffe Drag Hunt were at Brabourne; and the 20th Hussars at Postling. At each of these functions the usual features, regimental, farmers', and open races, were on the card. The East Kent Hunt in recent years have chosen Smeeth for their point-to-point meeting, whereas the West Kent adopt the peripatetic principle, Kemsing being the *venue* in 1906 and Leigh in 1907. The Eridge meetings, held on Easter Monday, are chiefly associated with followers of the West Kent, and the names of many well known amateur riders figure in the *Calendar* returns. Two owners of Derby winners—Mr. J. W. Larnach and the late Sir James Miller—have been successful over the Eridge country, and two well known horsemen of the present day—Mr. George Thursby and Mr. H. M. Ripley—have been seen on winning horses. The Mid-Kent Stag Hunt holds a point-to-point meeting annually at Ulcombe.

By far the most important gathering in Kentish hunting circles in recent years was that brought to a successful issue near Edenbridge on 20 April 1907. The Old Surrey Hunt, in conjunction with the East Kent, Eridge, Burstow, South Union, Crawley and Horsham, West Kent, and Tickham Foxhounds, Mid-Kent and Surrey Stag-hounds and West Kent Harriers, joined forces with the members of the Stock Exchange, whose annual steeplechases were included in a strong programme of Inter-Hunt and farmers' races. As may be imagined, the attendance at Mowshurst, the chosen country, was a remarkable one, and a splendid afternoon's sport ensued. Although a trifle holding, the going, which was over $3\frac{1}{4}$ miles of capital grass land, was better than had been experienced for some time previously. The first event, the Stock Exchange Light Weight Challenge Cup, went to Mr. L. R. Carr's Warwick (owner up), which only beat Mr. J. E. Steven's Larry by half a length. Next came a light-weight steeplechase confined to Old Surrey subscribers, and here the successful horse was Captain E. H. Trotter's Khalifa II (owner riding). There were only three competitors for the Stock Exchange Heavy Weight Challenge Cup, but Mr. G. N. Murton's Ballinkee, which had won the Cup in 1906 and had just previously finished eighth in the National Hunt Steeplechase, frightened away nearly all opposition and won easily. Mr. H. W. Boileau's Glencoe and Napper Tandy were 1st and 3rd respectively for the Old Surrey Heavy Weight Steeplechase, but the winner had hard work to shake off Mr. C.

Leveson Gower's Utility, which only succumbed by a neck. The Tenant Farmers' Steeplechase was marred by a nasty accident which necessitated the destruction of one of the runners. The winner, Mr. A. Hawkins' Chittenden Lass, was skilfully handled by Mr. Slyfield, a well known follower of local hunts. A big field mustered for the concluding event, an Inter-Hunt Sweepstake for horses owned by subscribers to any of the hunts concerned in the day's sport, by officers quartered in Kent, and by tenant farmers within the boundaries of the various hunts. Mr. A. N. Watts, riding his own horse Starlight, beat by two lengths another animal of the same name, ridden by Mr. E. Shackle, but owned by Lord Hardinge, who, on Carlow, was one of the unplaced competitors. Mr. H. W. Boileau, the popular master of the Old Surrey Hunt, during the afternoon entertained no fewer than 600 farmers and friends, and from start to finish the whole proceedings went with a rare swing, testifying strongly to the popularity of the various packs represented. The gathering will long rank as one of the most memorable in the annals of point-to-point races held within the county, and it is to be hoped that the venture will be often repeated.

DRAGHOUNDS

The county can only boast of one Drag Hunt, the Royal Artillery, but this pack is one of the oldest in the kingdom. It was established by Veterinary Surgeon-Major Thacker, R.A., in 1866, three years after the famous Household Brigade Drag Hunt, which appears to have been the first of its kind. The pack hunts in various parts of Kent and also occasionally goes into Essex. Fixtures nearest home (the kennels being at The Camp, Woolwich) are in the neighbourhood of Chislehurst, Bromley, Eltham, Orpington, Farningham, and Foots Cray, but some good lines with plenty of jumping are reached in the Tonbridge, Westerham and Sevenoaks districts. The pack consists of fifteen couples of hounds, and meets on Tuesdays and Fridays. Captain H. Rochford-Boyd, R.F.A., is master (since 1906), and previous masters have been Captain 'Sam' Lynes, Captain Albert Williams, Major Hale-Worthing, Captain Winyates, Captain A. E. Turner, Captain R. Alexander, Captain Isaacson, Lieutenant Eustace, Lieutenant Torkington, Major Ward-Ashton, Captain Tyler, Major Hickman, Lieutenant the Honourable A. E. Allsopp, Major Jeffreys, Captain de Roebuck, Lieutenant Courtenay

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McKenzie, Major Yorke, Lieutenant 'Midshipmite' Powell, Captain 'Rajah' Paget, Captain 'Jack' Hanwell, Major J. Dunlop, Captain H. du Pré, R.H.A., Captain H. Ramsden, R.H.A., Captain M. Powell, R.H.A., Major D. Arbuthnot, R.F.A., 1904-5; and Lieutenant C. G. Mayall, R.H.A., 1905-6.¹

FOOT HARRIERS AND BEAGLES

The Badlesmere Foot Harriers were established in 1903 to hunt the country vacated by the Blean Harriers. The pack, which is a private one and is owned by the master, the Reverend Courtney Morgan-Kirby, consists of 13½ couples of pure old southern hounds, all blue-mottled, and from 23 to 27 inches.²

Mr. Morgan-Kirby, writing of his pack, says: 'The southern hound has two great gifts—wonderful scent and glorious music, the latter like thunder, rising and falling in beautiful cadence; otherwise he is a quarrelsome, obstinate, high-strung brute, always fighting in kennel, and riotous when out until he settles down to a line, when there is no getting him off it.' Mr. Morgan-Kirby founded his pack with the oldest of the pure Sandhurst blood, and has crossed entirely with three northern packs. The Badlesmere country is almost entirely hop-gardens with a little marsh-land, and is not a good scenting country. The average kill for the season is sixteen brace. The pack hunts twice a week, and the kennels are at Badlesmere Rectory near Faversham. At the Reigate Hound Show in 1905 Mr. Morgan-Kirby's hounds took first prize for southern hounds.

The Fordcombe Foot Harriers are a subscription pack founded in 1870, and consist of ten couples of 18-inch pure harriers. They hunt the country near Tunbridge Wells on the Sussex border, and go also into that county. The kennels are at Fordcombe and the pack meets twice a week. Mr. W. Hollamby, Hickman's Farm, Fordcombe; and Mr. W. E. Urquhart, Castle Hotel, Tunbridge Wells, are joint masters.

The Tonbridge district is hunted by the Hadlow Foot Harriers, whose territory is much the same as that once in possession of

the Fox Bush Harriers. The pack, which is supported by subscription, was established in 1903 by drafts from the Fox Bush kennels and from other packs. Meeting days are Wednesdays and Saturdays, and the pack consists of fifteen to twenty couples of 18-inch harriers. The master, who has held office since the pack was founded, is Mr. J. P. S. Hervey of Faulkners, Hadlow, where the kennels are situated.

OTTER-HUNTING

Most of the rivers of Kent are well supplied with otters, and those animals are suffered to exist in these waters rather more plentifully perhaps than in the majority of the southern counties. But the reason for this forbearing attitude towards the otter, creditable as it is, is to be found, one fears, simply in the fact that angling is not pursued within the county so vigorously as in other parts of the country, where trout streams are more numerous and rents for the rights of fishing proportionately high.

Of late years otter-hunting has grown greatly in public favour, especially in the home counties. Kent itself, for instance, was without an established pack of otter-hounds until a few years ago, when the nucleus of the Crowhurst pack was got together by Mr. W. E. F. Cheesman. Mr. Cheesman's first intention was to buy up a few couples of 'marked' hounds to hunt the streams and ditches around Crowhurst in the adjoining county of Sussex, and he set to work in January 1903 to collect his pack and sound the sporting people of the neighbourhood upon the idea of establishing a recognized pack. The move proved to be a popular one and in a very short time it had the support of nearly every lover of hunting in Kent and Sussex. Negotiations were entered into with Mr. Graham-Clarke, owner of the Culmstock Otter-hounds, from whom Mrs. Walter Cheesman, aunt of the prime mover in the undertaking, purchased 8½ couples of hounds in February 1903; and by the end of that month the new pack was installed in kennels at Crowhurst. Leach, an old huntsman of the Cheriton Otter-hounds, was engaged as huntsman and Mr. H. K. Mantell of Crowhurst was appointed master. From the first the pack has been under the control of a committee, to which the hounds are lent by Mrs. Cheesman.

The Crowhurst Otter-hounds held their inaugural meet under the walls of the picturesque castle of Bodiam in Sussex on 13 April 1903, this being the first meet of any recog-

¹ *Baily's Hunting Directory*, 1907.

² This is one of the few packs of pure old southern hounds now remaining, and there are said to be only three others still in existence, namely, the Penistone, the Holmfirth and Honley, and the Stannington—all in the north of England. The Penistone claims to have kept its blood pure since 1260.

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nized pack of otter-hounds that had ever taken place in Kent or Sussex. Some two or three hundred people turned out to meet the pack, and ever since that day the venture has been warmly supported both in Kent and Sussex. The pack hunts the whole of the former county, as well as the latter as far west as Midhurst, and a portion of Sussex in the neighbourhood of Horley.

For the most part the rivers of Kent are deep, muddy and very much overgrown, the few exceptions to the general rule being provided in the case of the Stour, Darent, and upper reaches of the Medway, where the water is very much clearer and less overgrown. Under these circumstances it is frequently a very difficult matter to score a kill; but for the drag the country is very well adapted on the whole, and blank days with the Crowhurst are the exception rather than the rule. Besides the waters already mentioned, the pack hunts the Teise, Beult, Eden, East and West Sussex Rothers, Ouse, Adur, Arun, Rudwell, and the Mole and tributaries.

The Crowhurst Otter-hounds are a subscription pack with about three hundred regular subscribers. The committee consists of nearly every well-known sportsman in Kent and Sussex, including such famous hunting men as the Hon. Ralph Nevill, who in his more active days was in all probability the best man with hounds in the two counties. In 1905 the pack killed five and a half brace of otters, which is about the usual average for the season, and seldom went out without finding. Most of the meets are within reach of London by the early morning trains.

Since the pack was established there have been a few changes in the officials. Mr. Mantell's mastership came to an end in 1904, when Mrs. Walter Cheesman herself assumed the duties of master, remaining in that position until 1907, when Mr. S. W. Varndell was appointed in her stead. The latter had formerly held the post of huntsman in succession to Leach, his previous experience having been gained with Mr. Courtenay Tracy's famous pack, to which he had whipped-in for some time. The kennels of the pack have now been moved from Crowhurst to Mowshurst Farm near Edenbridge in Kent.

Several years ago it appears that a scratch pack of otter-hounds hunted these waters under the direction of the Hon. Geoffrey Hill; and Mr. F. P. M. Maryon-Wilson, an officer in the 17th Lancers, who died in 1893, used to hunt the Ouse and its tributaries. But, as has already been stated, the Crowhurst Otter-hounds are the first properly recognized pack to hunt the district.

Of earlier otter-hunting than this in the county there is no record, and in olden times otters were simply regarded here, as elsewhere, as vermin with a price put upon their head, and fair game to every murderously inclined individual who chanced to come across them. Matters are not quite so bad as that nowadays, but the killing of otters other than in fair pursuit is not yet looked upon as a crime equal to that of vulpicide. The man who shoots or traps an otter generally regards it, indeed, as a deed worthy of record in the local newspaper.

COURSING

Public coursing in Kent seems to be of comparatively recent origin, for Goodlake¹ makes no mention of any meeting held within the county. Reference to Thacker's *Courser's Annual Remembrancer and Stud Book*, published from 1840 to 1858, also fails to provide enlightenment, for not a single fixture is recorded during the period named; and not until 1867 is there any record of sport provided by the *Coursing Calendar*, the first number of which was issued in 1857.

It is clear, therefore, that such coursing as did take place in the first half of the last century or before must have been confined

to landed proprietors and their tenantry, whenever the latter were permitted to keep greyhounds. The writer can vouch for the accuracy of the following story, which throws some light upon early coursing in one portion of the county. The Island of Elmley—now connected with Thanet—was in olden days a favourite rendezvous for coursing men. There was but one church on the island, and that a very ancient one and in sad need of repair. The ravages of time had eaten away its foundations, so much so that in several places it was easy for an animal as large as a hare to run in and out beneath the building. Nearly every hare in the island knew of this safe hiding-place, and whenever coursing was in progress the hares made straight for

¹ Thomas Goodlake, *The Courser's Manual or Stud Book*, Liverpool, 1828.

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the church. Here, as in the case of human delinquents in former times who fled to sanctuary, they were free from molestation, and no attempt was ever made to molest further any hare which reached the churchyard in safety. But the time came when it was necessary that the church should be repaired and the rector (who, by the by, only paid a visit about once in six months) came to the owner of the island for a subscription. The latter was a generous man and quite ready at all times to put his hand in his pocket in a good cause, but he made it a bargain that if he subscribed towards the repair fund, his hares should still be allowed sanctuary beneath the church. To this the pastor refused to agree, and eventually he got his own way much to the chagrin of the owner of the land and to the discomfort of the hares.

Although there were no open meetings held in Kent in 1857, the following names of Kentish men appear in the list of 'Public Coursers' in the first volume of the *Coursing Calendar*—Mr. Blenkiron of Eltham Park; Mr. E. Collyer of Southfleet near Gravesend; Messrs. W. and J. B. Strother of Shooter's Hill; and Mr. Walter Vipan of The Hermitage at Erith.

The *Calendar* of 1867 is the first volume to contain any returns of Kentish coursing, and two meetings then came into vogue. These were the Quex Park Club (Isle of Thanet) and the Downs Club (Sandwich). The former meeting under distinguished patronage yielded very good sport, and many stakes of fair value were decided at the several fixtures carried out each season; indeed, it appears to have been the most influential club in the county's brief coursing history. The Quex Park gatherings, however, only extended over some ten years, and strangely enough its co-pioneer, the Downs Club, flickered out in the following year, 1878.

In 1873 two new ventures were embarked upon, the Isle of Sheppey and the Sevenoaks meetings. It is however hardly correct to refer to the latter as a single meeting, for the *Calendar* returns details of sport

as having taken place there under the several heads of Sevenoaks, Otford (Sevenoaks) and Otford Castle (Sevenoaks), from which it would appear that there were two, if not three, different bodies in existence in the district. They all dropped out, however, about 1880, and in the Isle of Sheppey coursing did not continue much longer, for no returns are given after the season 1882-3. A year later the Wye (East Kent) meetings came into existence; but they, too, have now disappeared from the fixture list.

In the last quarter of the nineteenth century coursing was promoted by the North Kent Club and by the Cliffe and Hundred of Hoo Club, and subsequently the Gravesend and the Edenbridge and Tonbridge Clubs came into being. An amalgamation of the Gravesend and Cliffe Clubs eventually took place, and they, together with the Edenbridge and Tonbridge Club, provide the only coursing now held in the county. Each conducted several highly successful meetings in the season of 1906-7, the Gravesend cards being generally the strongest, although nothing ambitious is attempted. These clubs are apparently in a prosperous position, although—situated as their meetings are at a great distance from the northern training grounds—they do not attract much more than local support.

No allusion to Kentish coursing would be complete without mention of Colonel North, who resided at Avery Hill, Eltham. His famous dog, Fullerton, divided the Waterloo Cup of 1889 and won outright in the three succeeding years. Although trained in Northumberland, Fullerton spent his declining years at the home of his proud owner. Destined to be the centre of sensational incidents, Fullerton proved to be, at the stud, as complete a failure as he had been a remarkable success in the coursing arena. The scare caused by his straying from his Eltham home, and the hue and cry raised during the few days he was missing, are fresh in the memory, and served to show how great a public idol Fullerton was. May Kent herself produce one as good ere long!

RACING

The story of Kentish racing is such that its chapters must deal principally with the incidents of a long buried past, for the county has been one of those most severely affected for a considerable period by the establishment of more popular fixtures in other parts

of the kingdom. Indeed, of its one time fame as a home of sport upon the Turf, it must be admitted that practically nothing nowadays remains.

This regrettable state of affairs is in no sense the fault of Kent or of those good

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sportsmen whom the county has produced; rather must the circumstance of Kent's loss of popularity as a racing area be attributed to the fact that the position of the county is out of the beaten track of the regular race-goer, and that the means of communication to and from its principal centres of sport have never been of the best. The race meetings of Kent have therefore always been almost entirely of local interest.

In its day the south-eastern corner of England was a noted field for sport and sportsmen; and no county can boast of a more faithful set of local Turf followers. Kent race meetings have been remarkably numerous in the past, and on Kentish soil have lived and flourished a goodly company whose names were associated with the early history of the sport. But from a review of the history of Kentish racing, extending over a period of something like two hundred years, it is abundantly clear that the county has been more prolific in the production of blood stock than in the exhibition of their prowess upon the race-courses which lie within its boundaries.

FLAT RACING

Although horse-racing of a kind was undoubtedly recognized in Kent as a popular sport during the earlier years of the eighteenth century, it is not until the year 1735 that any particular records of interest are found. The first note of importance that we can discover tells of the holding at about this period of meetings at Barham Downs near Canterbury, where the sport seems to have been of a very similar kind to that in vogue at other meetings in various parts of the country. The events were quite local in character and most of them were carried out under very primitive conditions. Mr. John Cheny, a racing historian of the period, has left behind him a very interesting treatise bearing the somewhat extravagant title of *An Historical List of all the Horse Matches Run and of all Plates and Prizes run for in England (of the value of Ten Pounds and upwards) in 1735-36*. From this carefully compiled volume we learn that Canterbury had its one day's racing at that time on Barham Downs, and the programme in 1736 consisted of a single event only. The extract is worth giving if only for the quaintness of the nomenclature of the competitors:

BARHAM' DOWNS, KENT, 1736.

On the 27 inst (August) at Barham Downs,

Kent, the Associated Annual Prize of 10 gns was run; 10 stone—one heat.

Mr. Winter's bay m Cat	. . . 1
M. Aldwell's chest. m Plain Dealer	. . . 2
Mr. Crosier's bay h Cripple	. . . 3
Mr. Wall's roan g Strawberry	. . . 4
Mr. Dennis' dun g Smuggler	. . . 5
Mr. Hornsby's chest. m Clumsey	. . . 6
Mr. Oakley's bay g Bacchus	. . . 7

It would seem from the conditions of the 'Associated Annual Prize' that prior to the publication of Mr. Cheny's chronicles there had been racing of some sort on Barham Downs, although it is probable that no other racing of any importance had been held in the county. This is the earliest discoverable record of *bonâ fide* horse-racing in Kent.

It is worthy of note, in passing, that Mr. Cheny's records, which of course bear an earlier date than those of Messrs. Weatherby, and like the latter were published by county subscription, contained the names of ten subscribers only for the county of Kent in the year mentioned. Among these we find that three are referred to as 'Esquires'—Richard Hornsby, John Corbett, and Richard Denne; while the plain 'Misters' include the names of Bellamy, Harrison, Winter, West, Arnold, Lee, and Crofter. In only one instance among the foregoing can we trace the name of any family known to latter day race-goers; and there is little doubt that the Mr. Hornsby here referred to as taking part in the 1736 Barham Annual Prize came of the same stock as the Hornsby of to-day, whose name will always be associated with the training of that popular horse, Victor Wild.

Canterbury Races became more important in 1739, when a King's Plate was granted to the fixture by George III. It was decided on 18 July, and was of the value of 100 guineas. The conditions further describe it as being the 'eighth Royal Prize of the year.' Dismal, a grey horse belonging to Mr. South, was the winner, and appears to have had a walk-over.

For a considerable time after this date Canterbury enjoyed fame in the racing world; but by degrees the popularity of the Barham Downs meeting began to wane, and Tenterden, another early scene of racing in Kent, went the same way as Canterbury; its supporters were attracted elsewhere and its race-course was buried by the plough-share. At the present time (1907) there is only a single meeting under Jockey Club Rules in the county, that well-tried venture at Westenhanger near Folkestone.

Among other old-established meetings on Kentish soil was that in the Isle of Thanet

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at Margate in 1820; the united Chatham and Rochester meetings began in 1822; Faversham followed suit the next year; and Tunbridge Wells inaugurated a fixture in 1824. At Ashford, racing was established two years later, and Dover came next, in 1827. Wye followed several years later, the first recorded meeting taking place there in 1849.

Of these early meetings of the last century the chief interest attaches to those held at Ashford, which flourished as a racing centre until 1841. The Ashford meetings were among the most popular of all race gatherings in the county, and in the entire history of early heat-racing in Kent it would be difficult to find a more notable occasion than the inaugural Town Plate of 1826. The distance of this event was a mile and a half shorter than the famous recorded four mile Give and Take Plate decided at York in the year 1784, which so pleased one Mr. Perram that he took the unusual course of bequeathing the sum of £30 to the owner of the winning horse.

The heats of the Ashford Town Plate, like that of York, numbered five, including one in which there was no decision, the judge being unable to separate the horses. The record of the race, which is remarkable enough in its way to be worthy of detailed mention here, was as follows:—

ASHFORD 1826

Monday, September 7. The Town Plate of 50 sovs; weight for age, winners extra; heats two miles and a half.

Mr. Tyr Jones ch f Partial by Sooth-	
sayer, 4 yrs.	-2 1 0 1
Mr. Scath's gr c Jack Bounce, 4 yrs.	2 1 2 0 2
Mr. Wickham's Mary Anne, late	
Ynysmaengwyn, aged	-3 3 --
Mr. Brown's b m Maid of Kent, 6 yrs.	
(wrong side of the post)	1 -dis --
Mr. Howard's ch m Sophia, 5 yrs.	-- dr --
Mr. Heathcote's wh c Syntax 3 yrs.	3 dr ---

Chatham's racing career has been of a very chequered character, its meetings having been held intermittently from 1822 to 1860. There is little of interest concerning them; but we learn that the Chatham course was 'one mile and one furlong with a straight run-in of a quarter of a mile with 24 rods all flat and in one field.' It is further recorded that 'the horses were seen from the judge's chair all the way round.'

Dover Races claim more attention. The races were originally held near the town beyond the castle, and there they might have been continued for many years had not some

trouble with the municipality arisen, which eventually led to their removal. A new site was thereupon offered by the seventh Earl of Guilford in his park at Waldershare, and here the races were carried on with some success until 1880. But although the new course at Waldershare was in every way vastly superior to the original *venue*, the removal of Dover Races so far from the town naturally had a prejudicial effect upon their popularity. When the races were held on the heights the occasion was considered a great social function and all the county magnates attended. Prominent visitors in the old days were Lord Palmerston, and the second Earl Granville, when in residence at Walmer near by.

It cannot perhaps be said that the horses that made their appearance at such fixtures as Dover were of remarkable excellence; but Cecil, winner of the Cesarewitch in 1868, figured at one of these meetings a month or so before he won the big race. Lord Guilford spared no expense in making the new course at Waldershare suitable in all ways for the purposes of racing, and spent a considerable sum of money in railing in half a mile straight of the three-quarters run-in of a track which extended for quite two miles round. Many an Epsom and Berkshire trainer has sighed at the sight of this excellent track and longed to transport it to his training grounds for use as a summer gallop. The turf was old and in good condition in all weathers, and a separate track, also laid out by his lordship and equally good in its way, was used for steeplechasing. Lord Guilford also erected a grand stand at his own expense and may be said practically to have run the meeting after its removal to his domains.

Things flourished for many a day at Waldershare until the passing of a new Jockey Club rule which raised the added money of a race meeting to £300 per day, of which £150 at least had to be given to a race of a mile or upwards. This new law was destined to play havoc with the success of other Kentish meetings besides Dover. Not only did it upset the smaller fixtures throughout the county, but it also in the course of time interfered greatly with meetings of far greater importance. Margate, Maidstone, Shorncliffe, Folkestone, Tonbridge, Wye, Rochester, and Bromley, as well as the original Canterbury meeting, the forerunner of them all, shared the fate of Dover one after another. A little meeting started in 1852 at Lenham, between Maidstone and Ashford, held out until 1860, during which period it was well supported

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by such men as Mr. J. S. Douglas, whose trainer was Drewitt. His horses were generally ridden by Fordham who rode the Squire of Lenham's Derby favourite, Tournament, at Epsom in Blink Bonny's year (1857), and if the horse was unsuccessful on that occasion the famous jockey rode him to victory in many another race worth winning.

Nearer London, flat races took place at Bromley, Eltham, Lee, Sheppey, Meopham, Woolwich, Gravesend, Blackheath, and Farningham, of which meetings, with the exception of Bromley, there is very little to be said. This meeting was at one time one of the most flourishing in the county, its name first appearing in the *Racing Calendar* in the year 1851. In the beginning, however, fortune did not smile upon the venture, and it died an early death, to be revived with better success in 1864. From that year until 1878, when it was finally abolished, the Bromley meeting had a prosperous career, and many a lively scene was witnessed on this popular course. It cannot be said that the horses which figured at the Bromley meetings, either on the flat or in the jumping events, were of exceptional class, and the only Grand National winner that we can discover as having competed on this course was Austerlitz, which won that race in 1877. But the names of well-known owners were always to be found on the card, and some of the best professional and amateur jockeys of the day were usually to be seen at Bromley. As a popular gathering this little meeting was always a great success and many were the regrets when, owing to various causes, the Bromley fixture had to be given up.

The Canterbury meeting always commanded the best attendance of notable horses, and the King's and Her late Majesty's Plates were, with few exceptions, well supported. These events were the annual autumn attraction on the race-course on Barham Downs, which adjoin the village of Bridge, about a mile and a half from the old cathedral city. We can only discover a single royal entry for the Canterbury Plates,—in 1806, when the Prince of Wales, afterwards George IV, won the event of that year by a walk-over with Barbarossa. From 1739 until 1852 these royal grants were decided in two or more heats. The first on record, as we have said, was a walk-over; but Rockingham, the St. Leger winner, won one of these plates in the colours of Mr. Theobald, the owner of Stockwell, in 1834, and walked over for a second prize in the following year. Red Deer, the Chester Cup winner of 1844, was successful in the Duke of Richmond's colours in 1845;

and in 1851, the last year in which the races were decided in heats, a most popular local victory was achieved by Firebolt, belonging at that time to Mr. Richardson and ridden by a son of C. Hornsby, who trained hard by at Bridge.

The little Kentish village was then and has been since the home of many a famous trainer and jockey. Besides the Hornsbys, there lived there the Tom Browns, father and son, the latter of whom afterwards took up his quarters at Newmarket; Fred Webb, who is said to have dreamt that he won the Derby in Doncaster's year (1873), and had the satisfaction of seeing his dream realized; and the Sherrards, of whom the present Whitsbury trainer, after riding with considerable success at most of the county meetings and elsewhere, prepared racers and steeplechasers at Bridge for Lord Conyngham and others. One of Sherrard's most famous charges, the property of Lord Conyngham, was a horse called Derby Day, who after winning a number of races on the flat essayed a Grand National, being ridden on that occasion by Richard Marsh, another man of Kent, who is the present trainer to His Majesty the King. Marsh was born at Smeeth on Christmas Day, 1854, and Kent may indeed lay claim to him, for the county of his birth saw the opening of his career in the saddle when at Dover races in 1863 Marsh won his first race on the old course.

Kent is also closely associated with another prominent figure in connexion with His Majesty's racing career, for at Chilham Castle near Canterbury, on 7 September 1860, was born Mr. T. Lushington, who not only has worn the royal colours on several occasions in welter races, but had the entire charge of Ambush II when he won the Liverpool Grand National of 1900. At the present time (1907) Mr. Lushington has more than one of His Majesty's horses under his care at the Curragh.

In the year 1852 the Canterbury Queen's Plate was reduced to a single heat, and as a result of this change better horses were seen in subsequent years in the list of starters. Mention need only be made of a few of the more famous winners: Mr. Thellusson's Rataplan won in 1855; Winslow, the Royal Hunt Cup winner, was steered to victory at Canterbury in 1873 by Fordham; and that beautiful mare Lilian, which won for her owner, Mr. Savile, forty-six races in all, including twenty-nine Queen's Plates, had a walk-over at Canterbury in 1874. The next year Lilian was beaten over the same course, with odds of 3 to 1 laid on her

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chance, by a very useful stayer in Snail, which subsequently won the Northumberland Plate for Lord Rosebery.

The Barham Downs course saw other sensational defeats besides that of Lilian, and no more exciting episode in the whole of Kentish racing history has ever occurred than on the occasion of the defeat of Caller Ou in 1863. This grand Malton mare, a St. Leger heroine, and the winner in all of forty-eight races, thirty-four of which were Queen's Plates, was not only beaten by Gibraltar, but, with odds of 5 to 4 laid on her, also had to figure in the finish behind Zetland. The former horse, a son of Cowl, was the property of Mr. Jackson, and was trained by Searle at Epsom, with Fordham up on the occasion of his victory over the St. Leger winner. His price on this occasion was the worst of the trio, the odds against his chance of winning being 5 to 1. But he beat Zetland by a length, and the judge's verdict gave Caller Ou as a bad third.

The Canterbury Queen's Plate came to an end in 1879, and the last winner to figure in its records was Vivandière, a horse belonging to Mr. Clifford¹ of London Bridge House.

The meeting at which Vivandière won was the last held on Barham Downs and thus was brought to a close a venture which, although somewhat chequered towards its close, had altogether lasted longer than others in the county.

The Canterbury collapse, however, came long before the final abolition of Queen's Plates in 1887, the money for the race-course grants being then handed over to the Royal Horse Commission, which, in conjunction with the Royal Agricultural Society, saw to its disposal. The society, when visiting Canterbury in 1860, had the compliment paid them of a race bearing the society's name being included in the Canterbury race programme. This event was won by a horse not inappropriately named Clydesdale, which also competed for the Queen's Plate decided on the same afternoon. In the latter race, however, the son of Annandale, the property of Mr. George Lambert, was beaten in a canter by half a dozen lengths by Mr. J. Saxon's Defender.

In those days Canterbury was only a one-day meeting, but its duration varied considerably in the course of its long career. In

¹ It was a son of this Mr. Clifford who met with his death at another of the Kentish meetings (Bromley). The Bromley course, indeed, has been singularly unfortunate in the matter of fatalities, for it was here too that a fall resulted in the death of James Potter, the trainer and jockey.

the earlier portion of its history one finds a four days' fixture referred to in the *Calendar*, and at other times a three or a two days' meeting is mentioned. The Canterbury race-week was always looked upon as the social event of the district, and the officers stationed there, at Shorncliffe and at Dover, always afforded a great measure of the support that it enjoyed.

Canterbury Races were associated with that good old-fashioned function, the annual ball, and in 1842 one of the races bore the title of the Ball Room Stakes, to which was added a whip subscribed for by the ladies upon the condition that competition for it should be confined to 'gentlemen qualified as for the Anglesey Stakes at Goodwood, with the addition of members of "Arthur's," the "Travellers," and those who have been members of either of the Universities of Oxford or Cambridge.' The length of this race was about two miles, and Mr. Tollit supplied the winner in Tiger, by Lottery, sire of the winner of the Grand National in 1839. Mr. Willan was the recipient of the whip.

STEEPLECHASING

To the late Mr. Richard Russell of Otford Castle belongs the credit of organizing the earliest of Kentish jumping fixtures about the year 1866. He began by promoting a meeting upon his farm at Sevenoaks, and the good send-off which this effort enjoyed promised better results than were subsequently achieved. There were plenty of starters at the opening meeting; some famous riders were present and carried off most of the principal events. Mr. Arthur Yates won a race on Harold, a horse upon whom he achieved a sensational performance at Croydon; and others who were successful in first catching the judge's eye were Mr. George Ede, Mr. F. G. Hobson, and Johnny Page, all of Grand National fame, besides Mr. W. H. P. Jenkins, one of the committee of the National Hunt, and Mr. 'Dick' Shepherd, a native of the district and a very favourite rider in the county. Mr. Russell was a good and well-meaning sportsman, but it is to be feared that many advantages were taken of his good intentions, and he found the organization of the sport rather more than he could manage. One of his friends, on being asked why it was that Mr. Russell gave up his steeplechases, remarked good-humouredly that he only did so when all the gentry of West Kent had lost their watches. Convinced at length that his services to this

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part of the county produced more harm than good the promoter of this pleasant little meeting was obliged reluctantly to abandon his good endeavours towards the promotion of steeplechasing in West Kent. As honorary secretary the West Kent Hunt had in Mr. Russell a good friend and a faithful honorary servant, and no one could carry out more happily than he those unpleasant duties connected with 'passing round the hat' which fall to the lot of every man in his position. His name is one which will live long in the history of Kentish sport and in the memory of those of his contemporaries still living.

Many an anecdote is told of 'Dick of Otford,' as he was familiarly known, and a quaint character he was in his way. He is said to have been a distant relation of the famous 'Parson Jack,' and his possession of the true sporting instinct rather favours the contention. The Hon. Ralph Nevill, a former master of the West Kent, wrote some verses having 'Dick' for their subject, and many a time have they been handed round for inspection at jovial gatherings of sporting men in the district. A couple of the verses run as follows :—

Let the sound of the horn, when reynard is found
The tally ho! forward! the cry of the hound,
Bring life and new vigour, with hearty good cheer
To Richard of Otford for many a year.

* * *

But when the time comes, as to all it must do
For saying 'good-bye' and bidding adieu,
To ground he must go, and with many a sigh,
We'll holloa 'Who-hoop!' and in peace let him lie.

Most of the meetings of the 'sixties and 'seventies were under the management of Mr. Marcus Verrall; but the East Kent Hunt had also at the head of affairs, in the person of the seventh Earl of Guilford, a man who was something of a 'character.' One year, however, he undertook more than he bargained for. Desiring to bring about a cessation of the many abuses of sport then in existence, his lordship took over the entire management of the meeting, and his butler, gardeners, grooms, and, in fact, his entire retinue of house servants were pressed into the service. Upon his lordship's arrival, he found the ring in possession of a fair company, and turning to the butler, who was in charge at the entrance, asked him how much money he had taken. The occupants, it appears, had taken advantage of the butler's inexperience to persuade him that they were members of the press and had thus obtained free admission! Lord Guilford, however, was a fine sportsman and expended a con-

siderable sum of money in the provision of amusement for soldier and civilian, and great was the regret felt when the news arrived of his fatal fall while hunting with the Cattistock, near Crewkerne, 19 December 1885.

Kent still retains some of its National Hunt fixtures, and of those now existing we have the pleasant annual outing at Eridge close to the Marquess of Abergavenny's picturesque seat at Eridge Castle, and the Wye meetings, held three or four times annually. Enjoyable enough as these latter fixtures are, they shine only with the reflected glory of an earlier day when Wye was in the heyday of its prosperity, and racing took place on the other side of the little town in the vale of Fanscombe. Those were the days of such notable owners as Lord Conyngham, Lord St. Vincent, Mr. C. S. Hardy, Sir John Honeywood, Lord Maidstone, and many other famous sportsmen.

These earlier Wye meetings were famous the county over, and were described by the 'Van Driver' of *Baily's Magazine* as being a subject worthy of any artist in search of a lively scene for his canvas. 'The sight from the hill,' he wrote, 'would delight a Linnell or a Maclise.' With regard to this meeting the same writer refers to an ancient custom adopted by the young bloods of the neighbourhood who decked their caps with coloured paper shavings, and no local celebrity at the races was entitled to be considered a village dandy without such adornment.

Kent has always been so intimately connected with the British Army that we are not surprised to find that races for military and gentlemen riders were usually a strong feature of the county's racing, whether on the flat or across country. The support afforded by the garrisons at Canterbury, Dover and Shorncliffe has already been alluded to, and during the last half-century Woolwich Garrison has contributed substantially to the sport. One of the chief annual events in connexion with that garrison was the Royal Horse Artillery Gold Cup, and at Eltham, Plumstead, and Bromley the military element was always strongly in evidence both upon the card and among the spectators. The Royal Horse Artillery have now drifted to Aldershot, but their long connexion with the county of Kent has caused them to leave behind the records of many brave gunners of the past, and of one or two still living among those who figured between the flags. Of the latter may be mentioned the name of Captain Annesley, while two of those who have joined the great majority

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were Major 'Driver' Browne and Major Dalbiac. Major Browne met with a fatal accident on the railway while crossing the line at Sandown Park, while a soldier's death in South Africa fell to the lot of Major Dalbiac, who had ridden the winner of the R.H.A. Gold Cup on three or four occasions.

Among other military riders who distinguished themselves in both branches of the sport within the county in those early days when the names of riders first began to find their way into the *Calendar*, the names of Captain Becher and Captain Little may be mentioned, while in more recent times we find the names of such good sportsmen as Captain Wentworth Hope Johnstone, the Hon. E. Jervis (afterwards Lord St. Vincent, whose father lives at Godmersham), the Hon. E. P. Willoughby (starter to the Jockey Club), Colonel Knox, Colonel Harford, the Hon. George Lambton, Captain 'Bay' Middleton, Major Hardinge, and Mr. Leveson-Gower.

Most of their saddle achievements were scored over fences, as were the successes of civilians like Mr. Arthur Yates, Mr. F. G. Hobson, Mr. T. Bayden, Lord Maidstone, Mr. P. Barling, Mr. Reginald Herbert, Lord Guilford, Mr. R. Shepherd, and last but not least Mr. William Bevill, always a master hand on the flat, and a favourite horseman in the days when the late Lord St. Vincent, the owner of Lord Clifden, was racing and a great patron of the sport in Kent. Mr. Bevill was not actually a native of Kent, but he spent so much of his time with Kentish folk that he became as popular with them as his father before him, and when he rode a winner at Canterbury his success was always the occasion for a great ovation.

To present-day racing in the county brief allusion only is necessary. There are only three places of sport, viz., Folkestone, Wye, and Eridge, the last mentioned being confined to one day's steeplechasing every Easter Monday. Important meetings being in progress on that day in almost every corner of the kingdom, it is only natural that the Eridge programme, with its modest prizes, does not attract much more than purely local patronage. At Wye, where five one-day meetings are held annually, much the same state of affairs obtains, and pleasant as are the gatherings there, the stakes are of small value and are competed for by horses hailing chiefly from the adjacent counties of Sussex and Surrey, the trainers at Lewes, Alfriston, Findon, Rottingdean, Portslade and Epsom furnishing about 90 per cent. of the runners.

At Folkestone racing takes place under

both Jockey Club and National Hunt rules, and though stakes of nominal value only are offered, the Folkestone executive are a very enterprising body and certainly deserve good patronage. Free stabling and fodder, as well as accommodation for stable lads, is provided, and their efforts are ably seconded by the South Eastern and Chatham Railway, over whose system horses and attendants are conveyed free of charge to and from the meetings. This concession to race-horse owners is not in existence on any other railway in the country, and so much is it appreciated that generous entries and good fields can always be looked for at Folkestone. On the other hand it must be admitted it does not tend in the direction of maintaining a very high standard of competition, for animals are sent for which under ordinary circumstances no great amount of expense would be incurred. During the closing years of the last century an occasional prize of the value of 500 sovereigns was given at Folkestone, but at that period only one or two meetings were held annually. Nowadays the chief stakes never exceed 300 sovereigns, the majority being of the minimum value of 100 sovereigns. In 1906 four meetings were held under Jockey Club rules, one day in June, a two-day fixture in August, and two single days in October. The arrangements for 1907 embraced five days again, but whereas the June and August functions were continued, a two-day meeting in September was substituted for the two single fixtures in October. Steeplechasing at Folkestone is conducted on much the same lines as at Wye, although the higher scale of stake ensures greater range of competition, and attracts a few useful hurdlers and chasers. The majority of the races are of the usual regulation type, with an occasional hunters' race thrown in. Five days *per annum* are devoted to this class of sport at the Western-hanger Inclosure—one day each in March, April, and May, and two days in December.

FAMOUS OWNERS, TRAINERS AND HORSES

Of famous studs Kent has possessed many, but all of the best animals bred at Middle Park seem to have been reared for sale, and those from Sir Joseph Hawley's famous farm at Leybourne, and from the late Lord Falmouth's paddocks at Mereworth appear to have fought most of their battles elsewhere. At any rate records of the prowess of Kentish-bred horses on Kentish soil are difficult to discover.

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Sir Joseph Hawley, however, on one occasion at least (in 1848) sent one of his horses to Canterbury for the Queen's Plate; but Miami, his representative, did not achieve success, although a year earlier she had won the Oaks. The race was run in heats as will be seen from the following table, the result being :—

Mr. Harrison's ch h Pyrrhus the First by				
Epirus, 5 yrs., 10 st.	A. Day *	1	1	
Mr. E. R. Clarke's b f Alphaia, 3 yrs., 8 st.				
4 lbs.	W. Planner *	2	3	
Sir Joseph Hawley's b or ro f Miami, 4 yrs.	Sly	3	3	2

From the foregoing table it will be seen that the first heat resulted in a dead-heat between Pyrrhus the First and Alphaia, the remaining two going to the former, who was none other than the Derby winner of two years before.

There is no trace of Lord Falmouth having gone to Canterbury even with one of Mat Dawson's lesser lights bred at Mereworth, a place still known to fame as the nursery of Hurricane, Kingcraft, Wheel of Fortune, Jannette, Childeric, Galliard, Busybody, and others, while Leybourne is no less conspicuous as having to its credit such good horses as Fitz Roland, Aphrodite, Teddington, Musjid, Beadsman, Blue Gown and Pero Gomez, besides the already mentioned Miami—all classic celebrities.

Lord Falmouth's great stud was disposed of by auction at Newmarket in 1884, and realized the large sum of 111,860 guineas. Sir Joseph Hawley's stud had been broken up in 1873, when it was sold at Middle Park.

The Blenkins—father and two sons—made the Middle Park stud famous. The stallions which they have had there include Blair Athol, Kingston, King John, and Gladiateur, and among the mares have been Seclusion and Shot. It is on record that Mr. Chaplin gave no less a sum than 1,000 guineas as a yearling for Hermit out of the former mare, and the very next lot, out of Shot, was knocked down to Mr. Merry for the same figure. Mr. Merry's purchase eventually came to be known as Marksman and the pair subsequently fought out a very memorable Derby, the verdict going to Hermit, which beat Marksman in a desperate finish to a hard fought race by a neck.

Little indeed now remains to tell the tale of the high-mettled racers once reared within those famous paddocks at Middle Park, and the only sign of quadruped existence that could be seen recently as one passed along the Eltham road was a board fixed at the end of

the old elm avenue, announcing the simple fact that horses were taken in to graze where so many heroes and heroines of the Turf once had their being.

Not very far removed from Middle Park is Avery Hill, where the late Colonel North¹ established a breeding stud, and succeeded in producing a very fair lot of horses. But this once busy centre of activity exists no more as an establishment for the raising of blood stock.

Leybourne was used as a breeding stud some time ago by Mr. Phillips, who, after Sir Joseph Hawley's death, had there among others Galliard and Peter; and Mereworth, where the sixth Lord Falmouth achieved so many successes, is now in the hands of his son, the present Viscount, who still keeps several brood mares there. So far he has not had the good fortune that favoured his famous father, but he can at least claim to have turned out one classic winner in Quintessence.

There are, or were, a few other studs, most of them of minor importance, upon Kentish soil, and a diligent search of the Stud Book would reveal the names of many famous horses who have been produced in this quiet little corner of England. Mr. Musker recently tried his fortunes within the county with Melton, at Westerham, where many brilliant horses have been produced from time to time, and Mr. John Corlett of *The Sporting Times* still struggles hard with his little lot out Sutton Valence way in the Staplehurst district. His luck with Torpedo Catcher has not been very great, but one of her progeny at least, Let Go the Painter, achieved the distinction of winning a race on native soil, when at Folkestone he carried off the chief handicap on the card.

It may be of interest to note, in conclusion, that one or two of Kent's long disused courses still remain, notably that at Bromley, which is now (1907) used as a golf links, thereby following the fate of many another once famous course in this and other parts of the kingdom. At Strood too, although the actual course has long since disappeared,

¹ It is a coincidence that the late Mr. Thomas Blenkins and Colonel North, who were connected with these two neighbouring breeding studs, are buried almost side by side in the little churchyard at Eltham. The former was the elder son of the founder of the Middle Park stud and the father of the owner of Ambition, who used to race in the name of Mr. Ellerton. It was this Mr. Thomas Blenkins who advised Colonel North to invest the money he had got from his nitrates on the Turf, with what successful results every one knows.

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there is a field of twenty-four acres now under cultivation, which is still pointed out as the site of the local races. It is a large level piece of ground at the west entrance to the Cobham woods as one goes from Strood to Cobham.¹

The best race-course ever used in Kent was undoubtedly that at Waldershare, but the second Lord Gerard, so well known in connexion with handicap coups at Ascot and Goodwood, laid out another which in point of excellence must have ran the Waldershare course very close. This

was at the time when he had purchased Eastwell Park, once the home of the Winchelsea family, and at a later period the residence of H.R.H. Alfred, Duke of Saxe-Coburg. Lord Gerard mapped out his course within the park, but it was never actually used except for the purpose of training a few horses. Ashford's old race-course still exists to some extent, and is now known locally as Hall's Field, a part of Ripton Farm. Its present peaceful purpose is to supply grazing for some prime Sussex cattle and a flock of Kent sheep.

POLO

The game of polo has never made much headway in Kent until quite recent years. The beginning of the game in that county may, indeed, be said to date from the establishment of the London Polo Club in the year 1899. The previous year had been one of marked activity in the polo world, and after a very successful season at Hurlingham and Ranelagh—the principal centres of the game—it was decided to inaugurate a fresh club upon somewhat similar, although much less ambitious, lines at the Crystal Palace.

Mr. Ernest Schenk, chairman of the Crystal Palace Company, was the moving spirit, and the club began under very promising auspices. Strictly speaking, the London Polo Club was not a wholly Kentish organization, but the majority of its members hailed from the neighbouring districts of Chislehurst, Beckenham, and other places in the county near at hand, and its ground at the Crystal Palace, Sydenham, was situated on the borders of the county. The chief object of the club was to provide men of moderate means with opportunity for indulging in the sport at a cost which should be much lower than that established by the members of the crack organizations at Hurlingham and Ranelagh. From the first the movement was marked by unqualified success, and under the able management of Major F. Herbert, the London Polo Club made rapid strides.

The first event of importance was the Inauguration Cup tournament, arranged to celebrate the birth of the club, play taking place on Whit-Monday 1899, and many of those who took part in the games on that occasion are still prominent supporters of the pastime. Among these may be mentioned

in particular the Earl of Shrewsbury, Captain de Lisle, and Mr. A. Rawlinson. The first Inauguration Cup was won by the Military combination, whose team was composed of the late Lord Kensington, Captain H. de B. de Lisle, the late Lieutenant-Colonel P. W. Le Gallais, and Captain F. Egerton Green, who defeated the civilians by seven goals to six. Upon the two following days the Army Cup, valued at 200 sovereigns, was competed for, and in the final round the 6th Inniskilling Dragoons, represented by Mr. C. H. Higgin, Mr. C. K. Ansell, Mr. Neil Haig (now Major, and still a keen player), and Major M. F. Rimington, carried off the trophy by beating the 10th Hussars by six goals to three. Among other clubs which took part in the tournaments at the Crystal Palace were Wimbledon Park, Tiverton, Holborough, and Cirencester.

In the same year a new tournament, instituted in connexion with the County Cup competition, was held at Eden Park, Beckenham. Major F. Herbert, who had done much to further the interests of the game all over England, also undertook the organization of this venture, and the final tie resulted in a victory for Chislehurst, who defeated Stansted by four goals to one and thus became first holders of the trophy.

Then came the outbreak of the South African War. Among those polo players who left for the front at the beginning of the campaign was Major F. Herbert, whose departure meant a severe loss to the interests of the game in Kent. Major Herbert's place was difficult to fill, but at length Mr. Eustace Blake came forward and was appointed secretary of the London Polo Club. He held office for five seasons, and was succeeded by Mr. R. E. Edmondson, an enthusiastic

¹ Smetham, *History of Strood*, 305.

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and skilled player, who has proved himself to be a most capable organizer.

The Eden Park and Chislehurst Clubs, both of which possessed splendid grounds, were for some years carried on in a more or less flourishing state, but the secession of many members, some of whom were called abroad on service, while others eventually joined the clubs at Hurlingham and Ranelagh, made the matter of maintaining efficient teams very difficult, and at last both these Kentish organizations, of which Eden Park held out until the end of the 1906 season, were broken up.

Upon the dissolution of the Eden Park Club the London Polo Club left its quarters at the Crystal Palace and migrated to the ground of the defunct organization at Beckenham. By so doing they made a very favourable move, for the ground at Eden Park is in every respect an excellent one. It is boarded all round, and with turf of first-rate quality it is undoubtedly one of the best inclosures in the country. Even in the worst weather the Beckenham ground is usually playable.

There is only one other polo ground in the county, namely that at Surrenden Park, the seat of Mr. Walter Winans. This inclosure is of full regulation size, and is fairly level.

The London Polo Club is now therefore the only recognized club of its kind within the county of Kent. It is, perhaps, at the present time more of a county organization than at any previous period of its history, and it numbers among its members several prominent players of the day. Among others who have recently been elected to membership are the two Messrs. Winans, who played

for the Oxford University team during the season of 1906. The Earl of Huntingdon is president, and is supported by a very strong and influential council. The regular days for play are Tuesdays, Thursdays and Saturdays, and a stud of ponies, which members may hire, is kept upon the premises.

Many prominent players have been associated with the game in Kent since polo first took root there at the end of the nineteenth century. Mr. A. Rawlinson, who took part in the Inauguration Cup competition at the London Polo Club's first tournament, was a dashing player, and had won fame in many a tournament in India. On his return to this country from the east he brought with him a couple of famous ponies—Rainbow and Starlight—both of which figured on several occasions in Hurlingham matches. The latter of these was a grey Arab with remarkable pace, and had won several races in India. Starlight changed hands subsequently and was played in the 10th Hussars team in the inter-regimental tournament at Hurlingham. Special mention should also be made of Major 'Tip' Herbert, brother of the founder of the Ranelagh Club, a remarkably fine horseman, and still a prominent player since his return to England after the war; Lord Shrewsbury, whose tastes have latterly turned in the direction of motoring; Captain de Lisle; and Sir Charles Wolseley, all of whom must now be reckoned among the old school of polo enthusiasts. Kent, however, can still reckon upon plenty of active support from the younger generation, prominent among whom may be mentioned Colonel Lamb, and Messrs. R. E. Edmondson, Avery, and R. P. Wilson.

SHOOTING

In common with the rest of the home counties Kent has suffered to a great extent from the rapid encroachment of the builder upon its fair fields and meadows, and year by year its opportunities for field sports are being driven within ever-narrowing limits. This gradual expansion of the town into the country has not affected shooting to such an extent as in the case of some other sports; but the establishment of factories, gunpowder works,¹ and large industrial

colonies in various parts, even at some distance from London, has done a good deal towards breaking up what was once an eminently sporting area.

While offering plenty of good chances to the keen shooting man, the principal charm of Kent lies perhaps more in the variety than in the quality of the sport which it has to offer. It is a county of very diversified character as regards its soil and general features, and as such is capable of providing what is

¹ It is interesting to note that the first gunpowder factories in England were established in Elizabeth's time by George Evelyn, who had mills at Long Ditton and near Wotton, in the neighbouring

county of Surrey. Richard Evelyn, the youngest of his long tale of sons, inherited Wotton, and from Richard's son John Evelyn, the famous diarist, descended the Evelyns of Sayes Court near Deptford.

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generally described as good 'rough' or 'all-round' shooting. For this reason it is an ideal locality for the man of moderate means, or for one whose ambitions do not soar to those lofty heights attained by the Hampshire partridge-driver with his 200 or 300-brace days, or the Norfolk pheasant-shooter with his enormous bag of rocketers.

Although a large part of Kent is still mainly agricultural, and divided up into big holdings that are well farmed by the few remaining yeomen agriculturists of the old school, a considerable acreage has been laid down to grass of recent years—a state of things that is never conducive to the well-being of partridges and pheasants. Such land is quite capable of supporting a moderate head of partridges and a still more moderate amount of pheasants; but the lack of food supplied on the stubbles in other districts results in an inferior and smaller breed of partridges and makes the pheasant to a great extent dependent upon artificial feeding.

Kent, as every one knows, enjoys the titles of 'The Garden of England,' and 'The Hop County,' the former by reason of the fact that orchard and market garden cultivation are two of its staple industries, and the latter because of its hop-producing reputation. Unfortunately for the shooting man neither of these occupations is particularly suited to game-preservation, for where the land is cut up into small holdings and a number of persons are constantly employed in the fields and gardens, there is little possibility for game to flourish. Birds, therefore, have been driven away from these much frequented areas, and even where they still have the courage to nest in the spring they must meet with a great amount of disturbance of an unintentional kind, and sometimes, one fears, of a description that is not precisely accidental. The hop-garden, although of little use as a feeding ground for partridges or pheasants, even when they can be left undisturbed, provides better security and cover for them than is afforded by closely cropped pastures.

Partridges, indeed, during hot weather are very prone to seek the shade and quiet of the hop-garden, and it is a little unfortunate that the Kentish hop-picking begins at about the same date as partridge shooting. The end of August sees a vast invasion of 'foreigners' from London and elsewhere, and just at the moment when it is desirable from the shooting man's point of view to keep the land quiet, the peaceful valleys of the hop-country are filled with the noisy clamour of families innumerable. Their coming is sufficient signal for every partridge

in the district to quit the scene of so much boisterous activity, and the shady hop-garden, which otherwise would provide a sure find for the partridge-shooter during the early days of September, is not worth beating.

Here and there, however, where the gardens lie in more secluded situations, the partridge-shooter will not always visit them in vain. It goes without saying, of course, that it is impossible to walk up birds in a hop-garden, where in the half-light that filters through the thick canopy of leaves overhead accurate shooting would be out of the question. Nor is there ever sufficient cover in the way of undergrowth in a well-ordered hop-garden to allow the sportsman to get within shot of the birds, although should the ground have been allowed to lie quiet for a few days before shooting, it is always worth while to include the hop-garden in the beat for the purpose of driving into more suitable cover any birds that may be lying hidden therein. Later on when driving proper begins—about the middle of October—the land is clear both of hops and hop-pickers.

Despite the fact that one end of it is about as modernized as it can very well be, Kent for the most part is very conservative in its customs, and many of its ancient ways are still followed as faithfully as those of its sister county of Sussex. The good old method of walking up partridges or pheasants from behind in preference to the more modern style of driving them to the guns is still in vogue in most parts, although driving is now extensively practised in the more open country. So much depends, of course, on the contour of the land, the style of farming adopted, and the size of the holdings, that no general principles of shooting can apply to the county as a whole. Some prefer one method, and some another, but every known style of game-shooting is practised in Kent.

When driving pheasants in flat districts, such as abound in this county, it is somewhat difficult to 'show' birds to the best possible advantage. It is not always easy under such conditions to make pheasants rise sufficiently to afford really sporting shots, and careful arrangement of each beat is necessary to obtain the best results. The birds must be gradually worked to the highest points of the covert without necessarily being shot at during the process, and it should be remembered that pheasants rise better from high covert as a rule than from 'short cut,' and that they generally fly better and faster when being driven towards home. But each keeper must arrange matters according to the nature of the ground with which he has

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to deal, and if he cannot produce good birds for the guns he proves himself incompetent.

Some of the best covert-shooting in Kent is to be had in those small outlying spinneys or 'shaws' (as they are termed locally) which are to be found near the Sussex boundary as well as in other parts of the county. The plantations of ash and Spanish chestnut, grown for hop-poles before the custom of growing the hop-bines on wires became so general as it now is, also afford excellent cover for game, and since most of these coverts are generally but a few acres in extent they are easily managed by a few beaters and a party of four or five guns. Comparatively inexpensive shooting of this description has been much sought of recent years by the man of moderate means, with the result that rentals have considerably increased in value. Not many years ago less than a shilling an acre was paid for fair rough-shooting, but the figure has now risen (1907) in the more accessible places to four or five times that amount.

Besides possessing good opportunities for pheasant-shooting, and some very good partridge ground, both red-legged ('French') and English birds being fairly evenly distributed all over the county, Kent has always proved particularly suited to the requirements of ground game, which, as in other parts of these islands, has been sometimes found a little too plentiful from the point of view of the farmer. Hares are found in good numbers on the downs near the coast, and in Romney Marsh and other open districts, where for the most part they are only shot in moderation out of respect for the local packs of harriers and the devotees of coursing. Woodland hares are met with in moderate numbers in the large coverts, and were once almost as plentiful as rabbits are now in most parts of the county. But the Ground Game Act of 1881 has depleted the number of hares in Kent as in other places, and although of late years an increase has been noted here and there, they can never again be as plentiful as they were before the Act came into force. The splitting up of large tracts of land into small holdings, each of whose occupiers carries a gun and sets snares, has placed an effectual check upon the increase of ground game, and a hare is nowadays a rarity in such places.

A method of rabbit-shooting, confined, we believe, to Kent and Sussex and one or two other counties, is worthy of particular mention. In every district where rabbits are plentiful it is the custom to hunt them

with a pack of beagles, which generally belong to farmers and others living in the district. This method of rabbit-hunting is far more effectual than the employment of beaters, before whom the rabbits refuse to run straight, doubling back past and through the line of men rather than face the open. When it is desired to hold a rabbit hunt in the Kentish woods the pack is brought together and some eight or ten guns station themselves in likely places throughout the wood. The pack having been let loose, the wood, supposing that there are plenty of rabbits, soon resounds with the merry music of the hounds, and the fun is fast and furious as the beagles drive the rabbits from cover into the rides, where the guns are stationed ready to shoot them. This form of sport is somewhat dangerous if careless guns are among the party, but with ordinary precautions accidents are of rare occurrence, and it cannot be denied that this rather happy combination of hunting and shooting affords a most excellent diversion, as well as providing the most satisfactory means of keeping the rabbits in check. Several packs of rabbit-beagles are kept within the county, but the majority of them are trencher-fed, and the whole system is carried on in a rather happy-go-lucky fashion. If rabbit-beagle packs were as well organized and hunted as packs of harriers, better sport might often be enjoyed.

Owing to its extensively wooded character—nearly one-twelfth part of the county consisting of woodland and plantations—the hills and valleys of Kent form a happy hunting ground for all sorts of birds and beasts generally classed by the gamekeeper as 'vermin.' Jays are exceedingly plentiful, especially in the oak and beech woods of the Medway valley, and magpies are by no means rare. The sparrow-hawk has been so persecuted that it may be said to be practically extinct except in a very few places, and the kestrel, although much more common, is by no means so plentiful as it once was. Tawny and barn owls are fairly common, especially the former, and the long-eared and short-eared owls are met with frequently in the autumn and winter. No mention would have been made of these birds, except perhaps the jay and the magpie, in an article dealing with shooting, were it not that too much stress cannot be laid upon the fact that the indiscriminate destruction of birds of prey is a great mistake. Individual pairs of sparrow-hawks and kestrels will sometimes attack the young of game and deserve to be shot, and jays and magpies will occasionally steal the

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eggs of pheasant or partridge, but to suppose that it is the custom of these birds to inflict serious damage upon the game-preserver is the greatest possible mistake. The owls should be welcomed as friends by all as destroyers of mice and rats, and their presence in agricultural districts is particularly desirable. The worst enemies of the game preserver are poaching cats and stray dogs, which can do more harm in a single day than all the rest of the so-called vermin can commit in a season. Not only do they catch and kill any bird or rabbit that they come across, but by their constant perambulations of the woods and fields they so frighten pheasants and partridges, especially when nesting, that the birds are likely never to return. Of birds undoubtedly the worst destroyers of eggs are the rook—a plentiful enough species in Kent—and the carrion crow, which is not very common in that county, but whose ranks are strengthened during the winter by the arrival of the grey-backed variety from the north. Stoats and weasels (the latter bearing in some parts the name of 'hedge-kine') are to be found in plenty when not continually trapped and shot, and the rat—one of the worst four-footed foes of the gamekeeper—is always more or less in evidence.

There is very little to be said about wild-fowling in Kent, a large part of the northern coast being entirely spoiled from the gunner's point of view by the amount of shipping and a numerous population. In the Thames estuary during hard weather wild fowl of various sorts are at times driven in from the open sea, but when this happens the gunners are so numerous that all chances of sport of the sort that is worth having are out of the question. Much the same may be said of

the Medway estuary of the Swale, where at one time a good deal of sport both ashore and afloat was obtainable. The rest of the Kentish coast does not furnish any great opportunities for wild-fowling; and punt-gunning, so ardently pursued during the season upon the Essex and Hampshire coasts, is not looked upon as a business with any prospects of sport or profit. Of later years, too, an immense acreage of marsh-land, where formerly mallard, wigeon, geese of sorts, and various other fowl, besides bitterns, herons, curlews, and many more water-loving species, made their homes, has been drained and turned into grazing land for cattle and sheep. One may still during severe weather come across a few duck here and there, but one may walk for miles sometimes and scarcely see a feather. Snipe are plentiful in certain favoured spots in the water-meadows, some seasons being a great deal better in point of numbers than others, and woodcock are found in fair quantity when weather conditions are favourable. But 'cock are not nearly so freely distributed to-day as formerly, and a bag of double figures in a day would nowadays be considered a matter for considerable comment. Not so very many years ago fifteen or twenty couple of 'cock in a day's shooting would not have been considered remarkable, but, whatever the cause of it, such things do not now happen. The year 1906-7 was a 'woodcock year,' and much larger bags were obtained everywhere than for several seasons previously, although none of the big totals of former times were reached. Another bird which seems to have grown much scarcer in Kent of recent years is the landrail, although from the sporting point of view that fact, perhaps, is little to be regretted.

ANGLING

Time was, many years ago, when the devotee of the fly-rod was wont to angle in the waters of the Medway and the Stour for the 'king of fish,' but much water has flowed since the last lordly salmon was taken from Kent's principal river with the aid of the rod. The Stour, however, can still boast of sea-trout within its tidal reaches, and these fish are occasionally captured by the persistent angler.

These two rivers supply the Kentish fisherman with the chief part of the angling within the county, and both of them can boast of a long record of sport. But the Medway

has suffered a good deal at the instance of the commerce of the district, which is very considerable, and pollution is not a thing unknown between its banks. One cannot say that the county has anything very exceptional to offer in the way of sport with what are commonly known as 'game' fish, but the fact that as much as £70 a mile has been asked for Kentish trout-fishing goes to show that the possibilities of the rivers of Kent are well understood, and that although they cannot offer such sport as the chalk streams of Hampshire, they can afford very good diversion. The Darent, which is a pic-

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turesque stream of typical Kentish pattern, provides sport of very fair quality with the trout, and very high prices are obtained for a few of the best stretches along its wandering banks.

Other rivers in the county, besides the three already mentioned, are the Lesser Stour, the Cray, the Beult, the Teise, and the Eden. Most of them are deep running and in places very muddy, while they are weedy and difficult to fish by reason of the steepness of their banks and the growth of bushes and trees which overhang the water.

The trout-fishing throughout the county is everywhere strictly preserved, and the same may be said in some instances of the 'coarse' fishing. Roach, pike, perch, and bream are met with in practically all the Kentish rivers, and some very good specimens of each kind are taken every season. The close time for coarse fish is from 15 March to 15 June, both dates inclusive, the dates applying generally to the whole of the rivers within the county.

Besides the rivers there are a number of lakes and ponds, most of which are open to the angler for the asking, but permission to fish must in nearly every case be obtained. In a few instances a small charge is made for week-end or day angling tickets, application a few days in advance being necessary. The Hythe Military Canal offers exceptional advantages to the angler, and is considered one of the best pieces of water in the county for tench, which run to a good size here. There is also fishing to be had in a number of 'fleets' or drains in the marshes close to the seashore. Visitors from London will find the Medway and the Stour the two most accessible rivers for those who do their angling with the assistance of the railway.

Of late years fish preservation in the Kentish rivers has received considerable attention, and the few streams which contain trout have been very much improved by re-stocking, and the enforcement of stringent rules concerning the size of the fish that may be taken. Similar regulations have been introduced in regard to the coarse fish—roach, dace, chub, and bream being well looked after in this respect. Even the murderous pike, whose friends are few in most parts of the kingdom, is encouraged, and runs to a good size in the weedy waters that he inhabits.

The metropolitan angler has always been encouraged by the railway company to visit the streams of Kent, and a number of London societies avail themselves of the week-end

and cheap day ticket facilities provided on the South Eastern and Chatham system. Local clubs and associations are also numerous, chief among these being the Stour Fishery Association, the Lesser Stour Fishery, and the Model Angling Club, each of these bodies having their head quarters in Canterbury. There are also the Tonbridge, Maidstone, Tunbridge Wells, and Yalding societies connected with the Medway; and the Herne Bay, Ramsgate and District, Deal and District, and Folkestone societies are to be met with in succession along the coast. These latter bodies include a number of anglers who besides being followers of the sport in fresh water also spend a good deal of their time in salt-water angling.

At Harrietsham near Maidstone there is a well-managed piscicultural establishment, known as the Fario Fishery, and owned by Mr. L. Mason. The chief fish reared here are the large English brown trout and the rainbow trout of America. A special study is made of natural fish food, and a large number of water plants of various kinds, suitable for river planting and useful in attracting different species of insects, are grown. Several of the private waters of the county have been restocked from this establishment, and the fish have done well. It is interesting to note, by the way, that there are no grayling in any of the Kentish rivers.

Kent's principal river, the Medway, rises near East Grinstead in the vicinity of Ashdown Forest, Sussex, and in the course of its meanderings towards the Kentish border the angler will find many a little quiet brook where moderate baskets of trout may be obtained. Some of these little tributaries run far more briskly than those lower down the river, and although the fish are small, they are of excellent quality and quite capable of affording good sport. The trout fishing in these secluded brooks reminds one of the sport to be had in the trout streams of the West of England, but the use of the fly is impossible upon some of them owing to the overgrowth of bushes along the banks. A few of these tributaries contain also roach and bream. The most notable angling stations for these parts and the best centres for visitors are Ashurst, Penshurst, and Groombridge—all near the Sussex border; and Watlington, East Farleigh, Yalding, East Peckham, and Tonbridge, farther along the Medway's course. About two miles above Maidstone there is a particularly good piece of water. For the most part the river is preserved—some of it by

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private owners, and the rest by various local clubs.

The Medway contains a great variety of fish—roach, bream, perch, chub, pike, tench, and carp, with a few trout, and here and there a nice little sprinkling of dace. There are a good many deep holes, muddy at the bottom and overgrown with weeds and rushes, making ideal haunts for the ponderous bream, which grow to a good size in situations so exactly suited to their requirements. Next to bream, roach and chub are most numerous, the latter fish finding congenial quarters beneath the shade of the many overhanging willows and alders. Here on a hot summer's day, armed with a goodly supply of cherries, the angler may usually secure a very respectable creel of these rather lazy fish. At other seasons the appetite of the Medway chub takes a great deal of tempting, and, like the trout, he is very spasmodic in his manner of feeding.

Except in autumn and winter, when the Medway is subject to sudden floods which, however, subside almost as quickly as they rise, the river is slow running, and although it quickly recovers its level after a spate, it takes several days to fine down to a colour suitable for fishing. At such times the angler will do best to concentrate his attention on some of the smaller tributaries of the river. During the winter months, however, when the water is somewhat thick and discoloured, fair sport may occasionally be had with the roach. In frosty weather good pike are frequently taken.

Angling competitions, in which a large number of London anglers participate each season, are very popular upon the Medway. The Tonbridge Angling Association looks after a distance of some eight miles of the upper reaches of the Medway and its tributaries, commencing at Ensfield Bridge near Penshurst, and extending to East Lock near East Peckham, where the Maidstone Angling Society takes over the management. Above Tonbridge the tributaries of the Medway are of a very winding character, with sharp bends and steep shady banks, somewhat difficult to fish but affording ideal haunts for fish of many kinds.

Fly is not much used on these waters, but there are a few places where the water lends itself readily to the higher branches of the art. Both the Tonbridge Angling Association and the Maidstone Angling Society issue day tickets to non-members. Further down the river at Yalding and Watlington there is plenty of free fishing to be had. At Yalding, during the season of 1906, some

good specimen roach up to 2 lb. apiece were taken.

Night-fishing for bream is a sport that is extensively practised in the Medway. The fish feed best late in the evening, and again in the small hours of the morning, but fair baskets are occasionally taken during the day. The custom of ground-baiting a few particular holes or 'swims' for several days in succession is generally adopted, and yields good results when the river is not too full of water. Warm, close weather is the best for this method of angling. Visitors to Medway waters will be struck by the use of a species of bait not to be met with, so far as we know, in any other part of the kingdom. The local anglers are credited with having discovered the killing power of this lure, which consists of pieces of cotton-seed (or cattle cake) broken up small and incorporated with bran, the mixture being used in the form of a ground-bait. Some anglers use a little of the cake upon the hook, working it up into a paste with bread, and the method is said to yield very good results with roach and bream.

Chub are taken occasionally in the Medway by the fly, to which, when the fancy takes them, they will rise fairly satisfactorily and afford good sport. A big Palmer, or Zulu tied rather large, or a wasp fly is the most suitable on these occasions. Cheese-paste and lob-worms are also used with ledger or float tackle, and young frogs or caterpillars may be tried when the fish are in sulky mood. Speaking generally, the best winter baits in the Medway for roach, bream, chub, perch and dace are paste, bread-crust, gentles, and red-worms.

There are so few instances of waters which have been rendered useless for fishing being restored to their original good condition, that cases of the kind may be considered worthy of special mention. Kent can provide a very good example of this desirable state of things in the case of the Stour, for at one time Fordwich and Canterbury were ports and did such good business in the commercial world that the angler had no opportunity for indulging in his pastime. Indeed, it seems impossible to believe that where the fisherman now plies his rod for roach and casts the delicate fly for trout, the Stour was once the scene of great commercial activity and full of ships and shipping. It is said that the river in those days had its mouth near what is now known as Pluck's Gutter—a favourite pitch for anglers below Grove Ferry, not far from Margate—flowing into an arm of the sea which separated the Isle

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of Thanet from the mainland. The present mouth of the Stour is at Sandwich, and the arm of the sea into which it flowed has disappeared, having given way to breezy marshes. Navigation is no longer possible as far as Fordwich and Canterbury, but in the olden days the largest craft came up the Stour as far as these two historic towns. No one would ever have dreamed that the navigation, which in the first instance drove the angler away, would ever so far disappear as to allow him to regain possession of the waters. The Stour at Fordwich is now quite a shallow stream, but it holds a few good trout, as well as a good number of coarse fish, of which roach are the chief.

Angling was held in high esteem in this part of the county in ancient times, and the fishing rights of towns and corporations were very jealously guarded. Izaak Walton, speaking of the 'Fordidge' trout, says of them that they are 'accounted the rarest of fish; many of them near the bigness of a salmon, but known by their different colour.' It is hardly likely that these fish were the ordinary river trout of our own time, and the probability is that they were sea-trout. At one time these fish, whatever they were, when they came up the river to Fordwich to spawn on the gravelly shallows thereabouts, were much sought after by the Mayor and Corporation, who would seem to have had their separate rights and privileges with regard to the capture of the fish. But the corporation appears invariably to have enjoyed the best of the sport, and had recourse to a cunning device to ensure a good bag. Every year when the fish came up the river these gentlemen caused the bed of the stream to be staked out in the form of a V, so that the ascending trout should all be driven inwards towards its apex. At this point a gap was left, and when the fish had become thoroughly accustomed to the arrangement, a bag-net was placed over the opening in such a manner that the fish, though able to enter it, could not get out again.

The principal angling stations on the Stour are Ashford, Wye, Chilham, Canterbury, Fordwich, Sturry, Grove Ferry, and Sarre, and the waters are preserved by a number of societies and private anglers. In the Canterbury district the Stour from Shalmsford to the cathedral town and from thence to Sturry is preserved by the Stour Fishery Association and the Lower Stour Fishery. Hereabouts there is some very good fly-fishing for trout, and tickets by the week or month are issued to the public by the associa-

tions. Trout are not allowed to be taken in these waters except with the fly, and all fish under 13 inches in length must be returned to the river. At Wye there is good roach and pike fishing in the winter, but in summer time the weeds interfere greatly with this class of sport. Roach also afford good sport at Brook, which is situated about two miles from Wye. The river at Chilham is preserved by Colonel Hardy. From Fordwich Bridge to Pluck's Gutter fishing is obtainable by the public from Mr. Thomas W. Gomm, who preserves this stretch of water, and issues weekly and season tickets. No roach under 9 inches in length may be retained. June, July, August and September are the best fishing months in these waters, but roach and pike provide good sport in the winter months. Blood Point near Grove Ferry is a noted hole for bream.

At this part the river is tidal, and holds roach, bream, pike and rudd, with here and there a few dace. Trout are not very common, and none under 16 inches in length are allowed to be taken. During certain seasons of the year considerable shoals of grey mullet and some bass and sea-trout, together with an occasional flounder, work up the river from Sandwich, and cause a good deal of annoyance to the roach angler, whose delicate tackle is not infrequently broken when large bass or mullet take his bait. The latter afford very good sport for local anglers. For roach the fishermen of the district rely chiefly on bread-crust and boiled wheat, and the writer has found ground bait and paste mixed to be very killing. Holiday anglers staying at Margate, Ramsgate, Deal and Herne Bay frequent the Stour at Grove Ferry, which is easily reached from any of those places. The banks at this part of the river are steep, and a landing-net with a long handle is necessary. The stream runs swiftly hereabouts at times, making the use of large well-shotted floats a necessity. Ledger-tackle instead of float-tackle is preferred by some anglers in these tidal waters on account of the strength of the currents. The river is clearer above Grove Ferry, and lighter tackle may be used for roach and bream.

Among the few rivers of Kent which may lay claim to being considered good waters for trout the Darent is the most important, although, of course, the upper waters of the Stour are also well known as the favourite home of the 'speckled beauty.' The Darent is everywhere strictly preserved, and its principal angling stations are Sevenoaks, Dunton Green, Eynsford, and Farningham.

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Lord Stanhope preserves the river at Seven-oaks, but the miller at Longford, close by, owns some water, and issues day tickets to visitors for roach and trout fishing. Eynsford affords some excellent trout-fishing—certainly the best that the river has to offer, and probably the finest in the county. This part of the Darent is closely preserved by Mr. W. B. Leaf, who has spent a great deal of money in improving the fishing and re-stocking with trout from time to time. Occasionally he has a rod to let. At Farningham a nice stretch of the river is leased by the proprietor of the Lion Hotel, who issues tickets for the season or for shorter periods. This fishing is well looked after and was re-stocked with brown trout in 1907. A variety of flies are used on the Darent, the best, according to season, being the following: red and grey quills, Wickham's fancy, March brown, mayfly, olive dun, black gnat, and hare's ear. A trout of 1½ lb. or so is nowadays considered very good on the Darent waters, but in 1844 Mr. A. Jardine took a magnificent specimen of 6½ lb.

Among the less important streams or tributaries of the county may be included the Cray, Beult, Teise, and Eden. They are in part preserved, but the sport obtainable in them is not very noteworthy from a general point of view. The public may fish them in parts, and there are roach, pike, and a few other coarse fish to be caught in all of them. Trout are met with occasionally in the Beult and Cray. The Cray, which before the period of pollution set in was regarded as a sport-yielding stream of no small merit considering its size, has a beautiful gravel bottom in some of its reaches, but owing to the discharge of unclean matter and the low state of the water of recent years, a great deal of rubbish has collected, and the river requires heavy floods or dredging before it can regain its former good condition. Signs of recovery have become apparent during the past two or three seasons and now (1907) the river is showing a fair flow of water once more, notably in the Sidcup and Bexley districts. An attempt has latterly been made to re-stock the Cray with trout, but it is to be feared that the value of the river for fly-fishing has been too badly affected to recover in a short period. The waters at Orpington, Sidcup Place, the Crays, and at Bexley are private.

The Beult is a tributary of the Medway, and has its source near Headcorn. It joins the main river close to Yalding. There is nothing to be said of it from an angling point

of view that does not apply to the smaller streams of Kent in general. The Teise, another tributary of the Medway, is a nice little stream which rises near Tunbridge Wells, and runs through Goudhurst, Horsmonden, and Staplehurst, and finally, like the Beult, empties itself, after a wandering career of some thirty miles, into the Medway near Yalding. Another sporting little stream, the Eden, which joins the Medway near Penhurst, holds a variety of fish, principally dace, roach, and gudgeon, with a few bream here and there. It is mostly in private hands and is well preserved. In the Edenbridge district permission may be obtained to fish its waters on payment of a nominal fee of a shilling or two per rod for the day. The Eden rises near Godstone in Surrey and is sixteen miles in length. Mention should also be made of the Ravensbourne, although as an angling stream its glories have long since departed. At one time good fish were caught in its waters, which extend for ten miles, but being, as it is, a tributary of the Thames, commercial enterprise has ruined its capabilities as an angling river. The Dour, from which Dover takes its name, is a small stream of no importance to the angler; and the Rother, which rises in Sussex and for some distance forms the boundary between that county and Kent, is, properly speaking, a Sussex river. It offers very fair sport to the general angler and a few trout of moderate size are to be caught in its reaches. It is, however, like a few other out of the way streams in Kent and Sussex, very badly poached in places, and some of its smaller tributaries are netted in wholesale fashion.

Besides its rivers Kent possesses a number of excellent lakes and other still waters, several of which are well stocked with fish. The majority of these are in private hands, but permission to fish them can often be obtained by application or introduction. The lakes at Leeds Castle near Maidstone hold some good perch and several pike of large size. Leave to fish here can be obtained occasionally. Mr. A. Jardine once caught a 36 lb. pike in the Leeds Castle waters, and other anglers have had several specimen fish during more recent times. Mr. Jardine's pike was landed in 1877, and still ranks as one of the largest fish of the kind taken in English waters. Perch weighing as much as 4 lb. apiece have been taken in recent years at Leeds Castle. In 1879 H.R.H. the Duke of Edinburgh captured another very fine pike of 24½ lb. in the lake at Eastwell Park near Ashford, the seat of Lord Gerard. In years gone by there was good

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fishing in Dartford Creek, and there are still ponds in the neighbourhood of Dartford holding carp, roach, perch, and bream, many of which run to a good size. The lake at the Phoenix Paper Mills contains bream, and visitors to the district can combine angling for trout and roach in the Darent between Crayford and Dartford with a visit to the water referred to. Permission can usually be obtained.

The Hythe Military Canal is a favourite resort with many anglers. It contains roach, rudd, tench, perch, carp, pike, and eels; and the bream and tench fishing is often marked by excellent sport in June, July, and August. Not a few anglers, particularly club fishers from London, pursue their sport by night in the warm months, and at times are rewarded with heavy bags of bream, tench, and eels. Near Hythe a member of the South West Piscatorials, Battersea, early in the summer of 1906 caught more tench one night than he could conveniently carry to the station—viz., 124 lb. The fish taken numbered fifty-eight, and in the evening they were on view at the angler's club in London. Tickets (1s. a day) are required by anglers in this district, and are to be obtained at the Swan Inn at Hythe. In the autumn and winter the canal furnishes sport for pike anglers, live-baiting and spinning both proving successful. One of the best reaches for pike is to be found at Ham Street. Many good pike have been taken here, and Mr. L. J. Weston, a member of the Hastings Angling Association, in the autumn of 1906 killed a 20 lb. fish. The water in the canal is rather shallow in many parts, and the finest tackle that can safely be used is to be preferred.

Anglers may be interested to learn that it is to the French that they must be grateful for the existence of the Hythe canal. Mr. Beavan in his book '*Fishes I have Known*' tells us that during our tremendous struggle with the French in the early years of the last

century, certain precautions were taken by the military authorities, in anticipation of a descent upon the south coast by our gallant foes. A chain of martello towers was one feature; a fresh-water canal between Sandgate and Appledore was another. Mr. Beavan's fishing experiences in the canal were not particularly happy.

The waterway [he says] has always been attractive to boating men and also to anglers, as it is reputed to be not only well stocked with roach, bream, and perch, but to contain a few pike. For the sum of, I think, two shillings per week, leave and licence is granted to angle for any of the above fish, but leave and licence is also granted to rowing boats on the canal, and so shallow is it, as a rule, that the oar-blades churn up the mud at each stroke. As the trippers in their gondolas pass the wretched angler on the bank, spoiling his 'swim' and sending his float out of sight, unparliamentary language is provoked, and the proverbial 'gentleness' of Izaak Walton's art is belied.

But Mr. Beavan must have been singularly unlucky, and the big catch referred to above has been made since he drew so mournful a picture of Hythe and its canal.

Probably the most remarkable fish ever taken in Kentish waters is that which is referred to in the following paragraph which appeared in *The Globe*, 26 September 1904: 'The Press Association says that a novel capture has been made in the river Medway at Rochester. A man named Buckingham went to witness the launch of a barge, and noticing a fish leap from the water and fly along the surface, he struck at it with his walking stick, with the result that he was able to capture it. It proved to be a fine specimen of the flying-fish, measuring fifteen inches in length. The wing-fins are very prominent. It is most unusual for so tropical a fish to come to our chilly shores.'

Stray pilot fish have been captured in Ramsgate Harbour, probably following a ship.¹

CRICKET

No county has a greater cricket history than Kent. As Lord Harris observed in his preface to the *History of Kent County Cricket* (Eyre and Spottiswoode, 1907), which must be the standard work on the subject, 'Kent has probably put good elevens into the field over a longer period than any other county.' Research shows that the earliest recorded match played within 'the garden of England' was at Malling in 1705, when eleven gentlemen of the west part of the county of Kent

opposed as many of Chatham for eleven guineas a man. In 1723 the championship had already apparently come thither, for in that year the Earl of Oxford speaks of 'the sport of cricket, which of all the people of England the Kentish folk are most renowned for, and of all the Kentish men the men of Dartford lay claim to the greatest excellence.' In the match between the Prince of Wales

¹ Arthur H. Beavan, *Fishes I have Known*, 83.

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and the Earl of Middlesex for £1,000 in July 1735, the latter's winning side was composed of Kentish men, whilst in 1744 there 'was played in the Artillery Ground the greatest cricket match ever known, the County of Kent playing against All England, which was won by the former.' Sir Horatio Mann was 'a batter of great might,' and the Duke of Dorset was another keen amateur, who when ambassador at Paris invited the earliest touring team, but the outbreak of the Revolution prevented this friendly invasion of France.

There is no record of Kent having played a match during the Napoleonic wars, but the county met, and was defeated by, England a month after Waterloo. The West Kent Club soon began its distinguished history, and it is notable that Mr. John Willes of Sutton Valence in Kent was the earliest exponent of round-arm bowling. The club was inaugurated at Town Malling; Fuller Pilch became the ground-man and such cricketers as Mr. Herbert Jenner and Mr. A. Mynn played, while Wenman is the oldest of the great wicket-keepers. The last survivor of the giants who took part in the four matches that Kent played with England in 1841 was Lord Bessborough, who died in 1895.

In 1837 Fuller Pilch, one of the very greatest of batsmen, scored 160 at Reigate for Town Malling. Felix, Hillyer, Mr. C. G. Whittaker, Mr. Percyvall Hart-Dyke and Mr. H. Norman belonged to this epoch. Many mighty matches played at Gravesend and at Tunbridge Wells, led to the formation in 1859 of a county club, of which the sixth Earl of Darnley became the first president. After losing five out of six matches in the first season, Kent was undefeated in 1860, and in 1861 twice beat England, Sussex and Surrey, only losing to Cambridgeshire. Willsher was the famous bowler of a rather precarious period which was closed in 1870 by amalgamation with the Beverley Club at Canterbury, Mr. de Chair Baker becoming secretary. Long before this time the annual Canterbury Festival had become the most charming feature of each season. Mr. G. M. Kelson shared with Willsher the burden of the cricket and proved a very fine bat with terrific hitting powers.

What we may call the modern history of Kent cricket begins with the appearance of Lord Harris in 1871. A fine bat who played splendid cricket and an excellent captain, he exercised remarkable influence over the game to which he has been so devoted. Of those with whom he first played Messrs. Yardley, C. I.

Thornton and Ottaway have imperishable names. Mr. M. A. Troughton was an excellent bat, whose son showed much promise in 1907. Henty was a good wicket-keeper; George Bennett proved himself one of the earliest successful slow round-arm bowlers; and Tom Sewell was a very fast bowler. A little later another good bowler was discovered in Mr. Foord Kelcey, whose pace was in marked contrast to that of Mr. A. Penn or Mr. C. M. Cunliffe. Mr. Frank Penn was a very punishing bat gifted with great defensive power, and Mr. C. A. Absolom played in characteristic if erratic fashion. Mr. Renny-Tailyour, a tremendous scorer in minor matches, was never quite successful in county cricket, but Mr. E. F. S. Tylecote was in the forefront as a bat and behind the wicket. Other useful run-getters were Mr. F. A. Mackinnon and Mr. V. K. Shaw. Junior to these was the Hon. Ivo Bligh, afterwards Lord Darnley, whose career as a prominent cricketer was shortened by ill-health. Few even of old Etonians could cut more brilliantly, and if he had curbed undue eagerness to score rapidly he might not have been so delightful to watch.

The Hearnés rendered yeoman service to Kent cricket. George Gibbons Hearne, one of the best young professionals of his day, was a capital left-handed bat and medium-paced bowler, but, good as he was, he never perhaps attained to the full what he promised. Frank Hearne, an aggressive bat and fine field, eventually went to South Africa where he had much to do with the development of the game. Alec Hearne appeared to possess the secret of never growing old. He was a patient painstaking bat and an admirable slow bowler who achieved the Kentish aggregate in each department. Ill-health materially prejudiced the career of that very clever medium-paced bowler Walter Hearne. All the Hearnés were exceptionally popular and universally respected.

In 1873, Kent met Sussex at Lord's to play the only Champion Cup match, the competition initiated by M.C.C. happily proving futile. When Kent and Gloucestershire played England at Canterbury, Osocroft received a blow in the face while batting and in falling put out his thumb. In the match against Sussex in 1876, 27 runs were needed—and successfully obtained—when the last man, Henty, joined Lord Harris. Against Kent, Dr. W. G. Grace, playing for M.C.C. in that year, scored his famous 344 at Canterbury. In 1878 Mr. A. Penn took six Sussex wickets for three runs and Mr. C. F. Tufnell created a record

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by bowling twenty consecutive maidens in the match against Notts. Next year Kent was dismissed by M.C.C. for 25, Barnes claiming 5 for 12.

A county so dependent as Kent on its amateurs naturally experienced considerable difficulty in collecting representative sides. Ill-health removed Messrs. Foord Kelcey, F. Penn and Cunliffe. A masterly exhibition in 1882 was that given by Rev. C. Wilson, subsequently Bishop of Melanesia, in his two great innings of 57 and 50 against the Australians. Mr. E. F. S. Tylecote played a memorable century.

A famous stand was that made by Lord Throwley and Lord Harris of 208 for first wicket against Sussex in the same year. Wootton was a somewhat expensive but fairly efficient fast left-handed bowler. Of higher class was Mr. Stanley Christopherson, a really clever fast bowler. Mr. M. C. Kemp was a capital wicket-keeper. Mr. F. Marchant, a magnificent hitter of uncertain type, soon shared the captaincy with Mr. W. H. Patterson, one of the most judicious and interesting batsmen who ever appeared. Mr. Rashleigh, a lively run-getter of very high class, and Mr. Leslie Wilson, who could score all round the wicket, played whenever possible.

Martin proved a fine bowler with a lot of spin on his ball which was invariably dead on the wicket. With him was soon associated Walter Wright, who made up for loss of batting by effectiveness as a fast bowler. He is the only Kentish representative in the last thirty years who has appeared after having played regularly for another county. Two sound bats who were seen too little were Mr. A. Daffen and Mr. C. J. M. Fox. Major L. A. Hamilton showed masterly judgement in his 117 against the Australians in 1890.

In 1884 Emmett bowled Lord Harris an over which yielded 3 wides and 15 runs off the four balls. In the next year the strong position which Lord Harris had taken up against the bowling of Crossland and Nash resulted in Kent declining to meet Lancashire. Wootton in 1888 claimed 5 of the Middlesex wickets for 8 runs, and Martin and Wright took 8 Notts wickets for 11 runs.

Kent made a bold bid for the championship in 1893. A century by Mr. Rashleigh in the match against Notts at Canterbury was remarkable because the fast bowlers made the ball bump as high as his head. Straight from Winchester came Mr. J. R. Mason, the finest cricketer Kent ever had, superb in every department, an admirable captain and beloved by every one. Mr. W. M. Bradley, a tear-

away fast bowler, came to do yeoman service, and in 1896 appeared Mr. C. J. Burnup, one of the best bats of his inches in modern cricket. Style enabled him to command balls that beat men of six feet high. Mr. S. H. Day, always brilliant, made a century in his first county match. In 1895, after scoring a first innings of 470, Kent was beaten by 9 wickets by Gloucestershire, for which Dr. W. G. Grace, almost forty-seven years of age, obtained 257 and 73 not out. In 1896 at Trent Bridge, Shrewsbury and Mr. A. O. Jones scored 223 for first wicket, to which Mr. J. R. Mason and A. Hearne responded with 195. Lord Harris, returning to county cricket after six years in India, amassed 119 in his first match. With Mr. E. B. Shine, Mr. F. Marchant (144 not out) added 158 in an hour against Warwickshire.

With the new century must be mentioned the Kent nursery formed in 1896 which, giving the county an exceptional army of capable professionals, reflects great credit on Mr. McAlpine, Mr. Pawley and above all Captain McCanlis. C. Blythe, who bowled Mr. F. Mitchell with the first ball he ever sent down for Kent, is the finest left-handed bowler discovered since Wilfrid Rhodes, whose successor he has become in Test Matches. Fielder, a capital fast bowler, set the seal on his fame by taking all ten wickets of the Gentlemen at Lord's for nine runs apiece in 1906. Seymour, a batsman almost as attractive as Tyldesley, is perhaps the best professional run-getter not yet selected for the Players at head quarters. Humphreys is a plucky hitter who can also get wickets. This quartette are only seniors among excellent juniors. Older than any is Huish, who has caught out 511 opponents in 243 matches and possesses an average never equalled by any wicket-keeper, for he has also stumped 114.

So long as he was able to play regularly Mr. Mason was the mainstay of his side in every department, while as time went on he seemed able to come into county cricket at any moment with form which showed no diminution. Mr. E. W. Dillon for a while was absolutely the best left-handed bat of the day. Mr. Mason had given up the captaincy to Mr. Burnup, and on the departure of the latter for Mexico, the old Etonian, Mr. C. H. B. Marsham—whose family had for generations been associated with the cricket of the county—admirably succeeded him. He is an excellent bat of a watchful type and the success of Kent in 1906 was greatly due to his capable direction. In that year Mr. K. L. Hutchings leapt to the front as a batsman of extreme brilliancy, and his form

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justified his being regarded as an English Trumper. Though he did not take his place in the county team until the middle of June he thoroughly deserved the honour of being chosen for the Gentlemen at Lord'.

In 1900, 56 runs were hit off Walter Humphreys, then aged fifty, on his first appearance for Hampshire. Owing to rain at Canterbury, Mr. C. J. Burnup was at the wicket for part of each of the three days for his score of 49. Against Hampshire 513 was scored in 219 minutes. Next year, Mr. C. J. Burnup and E. Humphreys made 108 and 100 for first wicket against the South Africans. Not one of the last five batsmen scored in the Somerset match. In two consecutive innings, against Somerset and Hampshire, three Kent batsmen exceeded a century in each match. At Canterbury in 1902 the last nine Surrey wickets fell for four runs.

In 1903 Kent played four matches in America and won them all. The finest performance of the tour was Mr. Mason's five wickets for six runs at Philadelphia. Against Sussex in 1904 only one run was scored off Blythe in an hour. The out match against Yorkshire at Harrogate was declared void as the wicket had been tampered with. Against Gloucestershire, Mr. Dillon and Humphreys added 100 for the third wicket in each innings. With only 45 minutes in which to make 81 at Worcester, Messrs. Mason, S. H. Day and Blaker made the runs in less than half an hour and won the match. In 1905 at Gravesend Humphreys took the four last Notts wickets in seven balls without a run being scored. A tie was played with Surrey at the Oval.

In 1906 for the first time Kent achieved championship honours, exhibiting cricket of such exceptional attractiveness that the enthusiasm aroused was commemorated by presentations and banquets. Two defeats were sustained—from Yorkshire and Lancashire—before the county embarked on eleven successive victories, subsequently increased to sixteen. Mr. Marsham at one period had lost the toss for nineteen consecutive matches. A remarkable game was that against Surrey at the Oval which Kent won by a single wicket. The colt, Woolley, who played with phenomenal success at a first appearance, took 3 wickets for 37 and 5 for 82, and scored 72 out of 101 after six wickets had fallen for 61, carrying out his bat for a cool 23 at the crisis. Against Middlesex Mr. K. L. Hutchings obtained 125 and 97 not out, and helped to stave off defeat in a critical stand of twelve agonizing minutes with Huish, the last man. Woolley scored

20 off an over by Mr. Morrison when the latter was bowling for the West Indians and Mr. Blaker 24 off an over from Bailey at Taunton. Against Sussex at Canterbury, Kent amassed 568, Messrs. Burnup, Blaker and Marsham getting centuries; the last 232 runs were actually made in ninety minutes, five overs producing 50 runs. Against Somerset, a fine score of 358 for 5 wickets was rattled up in two hours and a quarter. When Kent met the Rest of England, the county, handicapped by bad fielding and the absence of Mr. Mason, failed completely in the second half of the match. The figures for the season were phenomenal; Mr. Burnup averaged 69 for 1,116 and Mr. Hutchings 64 for 1,358, Messrs. Dillon, Mason and Blaker all exceeded 40 for over 500 runs and Seymour averaged 32 for 1,096. Fielder, who took 158 wickets, and Blythe, who captured 90, each with an average of 19, bore the brunt of the bowling, no one else taking 45, and all the rest of the attack only gaining 156 between them. The all-round promise of Fairservice demands note, whilst Huish disposed of sixty opponents at the wicket. The season of 1907 witnessed a sad falling-off which was due to uncertain fielding and over-confident batting on wickets too slow for forcing tactics.

Since 1719 Kent has won 377 matches, lost 422, played 3 ties and 161 unfinished games. Nine batsmen have scored a thousand runs for a season for the county; namely Lord Harris in 1884, and since 1895 Mr. J. R. Mason (7 times), Mr. C. J. Burnup (6), Seymour (4), Alec Hearne (3), Mr. A. P. Day, Mr. E. W. Dillon, Mr. K. L. Hutchings, Woolley and Humphreys once each. Nine bowlers have captured a hundred wickets in a single season, namely G. G. Hearne in 1877, J. Wootton in 1884 and 1886, and since 1890 C. Blythe (7 times), Mr. W. M. Bradley, Fielder and F. Martin (twice), W. Wright and W. Hearne (once each). Summarizing the averages, the following are the chief performers:—

BATTING			
	COMPLETED INNINGS	RUNS	AVERAGE
C. J. Burnup	257	9,727	37.87
J. R. Mason	415	13,835	33.33
E. W. Dillon	167	5,267	31.53
Lord Harris	260	7,806	30.02
BOWLING			
	RUNS	WICKETS	AVERAGE
Willsher	9,469	755	12.54
Hearne, G. G.	9,518	577	16.49
Wootton	10,619	628	16.90
Martin	17,579	979	17.95
Blythe	18,910	1,044	18.11
Hearne, A.	20,543	1,036	19.82
Wright	14,308	725	19.73

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The following Kent cricketers have represented England in Test Matches at home: Lord Harris, Messrs. F. Penn, E. F. S. Tylecote, W. M. Bradley with Martin and Blythe. Mr. J. R. Mason has been among the selected.

The following Kent cricketers have toured in Australia:—

Lord Harris (1878), Hon. Ivo Bligh (1882), Messrs. C. A. Absolom (1878), F. A. Mackinnon (1878), F. Penn (1878), E. F. S. Tylecote (1882), J. R. Mason (1897), C. J. Burnup (1902) and K. L. Hutchings (1907), with G. Bennett (1861), T. Sewell (1861), C. Blythe (1901 and 1907), and Fielder (1901 and 1907).

The following Kent cricketers have played for the Gentlemen and Players match at Lord's since 1871: Lord Harris, Hon. Ivo Bligh, Messrs. C. J. Ottaway, W. Yardley, F. Penn, E. F. S. Tylecote, M. C. Kemp, S. Christopherson, W. H. Patterson, F. Marchant, W. C. Hedley, J. R. Mason, G. J. Mordaunt, W. M. Bradley, C. J. Burnup, K. L. Hutchings with G. G. Hearne, Martin and Fielder.

Since 1878 the following Kent cricketers have appeared in the University match: For Oxford, Messrs. B. D. Bannon, E. W. Dillon, T. R. Hine Haycock, M. C. Kemp, C. H. B. Marsham, G. J. Mordaunt, W. H. Patterson, W. Rashleigh, A. J. Thornton and E. C. Wright. For Cambridge: Hon. Ivo Bligh, Hon. C. M. Knatchbull-Hugessen, Messrs. R. N. R. Blaker, C. J. Burnup, S. H. Day, W. P. Harrison, R. S. Jones, F. M. Meyrick Jones, F. Marchant, T. N. Perkins, E. B. Shine and G. J. V. Weigall.

This brief review of the glorious record of Kent cricket has not permitted reference to the renowned Canterbury Festival, nor to the charming series of weeks at Maidstone, Tonbridge, Tunbridge Wells and elsewhere which combine to make Kent cricket the most delightful in contemporary sport. It is likely that in the future the elevens may surpass even the achievements of their predecessors. Moreover, in the true sense of the word, they always play the game.

GOLF

The county of Kent possesses two characteristics which combine to make it a natural centre for golf—the sandy nature of a good part of its long coast-line, and the fine turf that covers its chalk down. When to these natural advantages is added that every part of it is within easy distance of London we are not surprised to find that golf courses of every shade of excellence are to be found within its borders. Kent is indeed the original home of golf in England, since the royal and ancient game has been played on Blackheath continually since the year 1608, when King James I introduced the Scottish game to the inhabitants of his southern kingdom. But the county possesses another title to fame in its four magnificent seaside courses of Sandwich (St. George's), Deal, Littlestone and Sandwich (Prince's); and there are those who maintain that neither in Scotland, nor at Hoylake, nor at Westward Ho! can finer golf be obtained than on the famous links of these clubs.

The golf courses of Kent may be classified, for convenience sake, in three groups—those which are laid out on true seaside turf with natural sand bunkers, and such hazards as are only found on sandy shores; those that are within sound and sight of the sea, but being on down or marsh-land are lacking in

the real seaside character; and those which are inland.

Of the first group—the true seaside links—there are only four, but those four are of superlative excellence. The links of the Royal St. George's Club at Sandwich are the oldest of these. The club was founded in 1887, and it has always held among southern golf clubs the proud position to which the excellence of its links and its possession of a championship course entitle it. The course has been recently lengthened, and with its fine tee shots, the admirable length of its holes, the careful and accurate approach shots that are required, and its splendid greens, Sandwich will long maintain its notable position among first-class golf courses.

Littlestone Club is one year younger, having been founded in 1888. The fine and lengthy course of this club is on the western shore of Dymchurch Bay, 1 mile from the ancient cinque port of New Romney. It is 6,128 yards long, the longest (18th) hole being 528 yards in length. It can hardly be called a naturally difficult course, and the lies throughout the green are on turf of such surpassing excellence that a brassy is hardly anywhere required—a play-club is all that is needed to pick the ball up from a perfect lie. The first seven holes, which are furthest from the sea,

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present no special difficulty to him who can drive 'far and sure'; but the prevailing south-west wind, sweeping from the sea across the marsh, plays havoc with a ball that is not truly hit, and the artfully disposed bunkers and the rough grass that borders the course are hazards that have spoilt many a medal score. From the 8th hole—perhaps the most sporting hole on the course—to the enormously long 18th play is on ground that is more diversified and of truer seaside character. The amateur record for the Littlestone course is Mr. S. C. Wyatt's 71, a fine score that has been beaten in one stroke by David Herd, the professional of the club. The Bar Golfing Society plays its tournament over this fine course, and the club shares with the neighbouring club at Rye in Sussex, the honour of entertaining in alternate years the competitors in the Parliamentary Handicap. The club has a very fine house; and has recently opened a second 18-hole course to the west of that of which we have given a very inadequate description. Meetings are held five times a year—at Easter, when the Purves Gold Medal, the Mayor's Cup and the Denge Challenge Trophy are offered for competition; at Whitsuntide, when the Ladies' Diamond Jubilee Cup, the Tubbs' Cup and the Bannon Bowl are the objects of competition; in August, when the Erskine Goblets for foursomes and the Denge Trophy are played for; in November, when the Autumn Gold Medal and the Coronation Cup are the principal prizes; and at Christmas, when the Winter Cleek is the challenge prize. The list of club trophies also includes the Waterlow Challenge Cup for the lowest gross medal score during each year, and the King-Farlow Cup, played for twice annually, not at a meeting.

A keen rival of these two famous clubs is the Cinque Ports Golf Club, founded in 1892, whose links are amid the rolling sandhills a mile from Deal. A great professional has declared that Deal is the best course in the south of England. Another good judge of the game has recorded his conviction that the last four holes at Deal afford the finest finish on any course, and there are many who subscribe to these *dicta*. Deal is a long course of 6,500 yards; every hole is of interest and of good length, the lies and the greens are nearly perfect, and the variety of stances and shots which the undulating surface of the ground affords, have combined to raise these links to a very high position in the regard of those who enjoy real golf. Deal has been very properly admitted during this present year—1907—into the charmed circle of

championship courses; and Kentish Golfers may well be proud that they possess in the links of the Cinque Ports and the St. George's Clubs two adjacent golf courses that are worthy of that high honour.

The records for the Deal green are 74 by Mr. H. B. Hayman, and 73 by Harry Vardon. The chief prizes that the club offers for competition are the Scratch Silver Challenge Cup at Whitsuntide, the Silver Challenge Cleek in August, the Borough of Deal Open Challenge Cup, and the Silver Challenge Irons for foursomes in October.

Prince's Club, whose 18-hole links at Sandwich were instituted in 1906, is the last and youngest of the true Kentish seaside courses. Its links adjoin those of the St. George's Club, and extend northward along the shore to Shellness. The surface is somewhat like that at Deal, undulating and covered with fine close turf, and the peculiarly long and narrow hog-backed greens demand accuracy in approaching; and the way in which, throughout this long course of 6,700 yards, the player finds at every hole that straightness is essential reflects great credit on the skill of the designers. The club has a very fine house on the seashore.

Of golf courses which, though at the seaside, have not the characteristic marks of sandy soil and natural sand bunkers, that of the Dover Golf Club is the oldest. The club was founded in 1890, and has a 9-hole course, with a length of about a mile and a half round, between the Deal and St. Margaret's roads. A terrifying chalk-pit, a farmyard and the ramparts of a fort are with artificial bunkers the hazards of this course.

Westgate-on-Sea has a 9-hole course, made in 1893, and a year later an 18-hole course of about 3 miles in length was opened on high ground above the town of Hythe, overlooking the sea. The links of the Thanet Golf Club are at Hengrove, a mile and a half from Margate, where an 18-hole course was laid out by Ramsay Hunter in 1896. The subsoil is chalk, and the hazards include made bunkers, a chalk pit and hedges.

The St. Margaret-at-Cliffe Golf Club has a 9-hole course opened in 1899, $4\frac{1}{2}$ miles from Dover, and the Herne Bay Golf Club, which was refounded in 1902, has links recently extended to 18 holes under the direction of James Braid on high and undulating ground at Eddington, on the road to Canterbury, about a mile from the sea. Two miles from Broadstairs is the course of the North Foreland and Kingsgate Club, on the cliffs between the North Foreland and Cliftonville, with the sea surrounding it on

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three sides. Lord Avebury and others were instrumental in founding this club in 1903, and the course, which is to be lengthened, is on good down turf with chalk subsoil. Play is possible all the year round; but the best time for the game is the spring and early summer. Bogey is less deadly than usual with his 79, and the amateur record is held by Mr. J. A. Harrison, who has done a round in 75. J. Higgs holds the professional record of 73.

The youngest of these semi-seaside courses, if we may so call them, is that of the Leysdown Golf Club, which is at Gosbee, in the Isle of Sheppey, 8 miles from Sheerness. This club was founded in 1904, when an interesting course of 18 holes was laid out by Mr. J. R. Divett, with the assistance of J. H. Taylor, on a space of some 200 acres on the Leysdown and Shellness estate. The club-house, which is a comfortable old farmhouse, is a quarter of a mile from the sea, and the links, which lie to the south of Leysdown, are on good pasture intersected with ditches and bounded by the seashore.

Of inland courses the most remarkable is that of the venerable Blackheath Club, which is just 300 years old. There are only 7 holes, one of which is the longest hole in golf; and these are played three times round in competitions. For many years Mr. F. S. Ireland's 101 stood as the amateur record. Harry Vardon and J. H. Taylor had each been round in 98; but these fine scores were all defeated on 1 October 1907, when Mr. A. S. Johnston, playing for the Glennie Medal, returned a wonderful card of 95. A player with a strong sense of humour has spoken not, perhaps, unjustly of Blackheath as a course whose hazards are nursemaids and lamp-posts; but the historic associations of the club, the good feeling of players which absolutely prevents friction with the public, and the excellent golf which, considering all things, is to be enjoyed on Blackheath, surely entitle this ancient club to the grateful recognition of all true golfers. There are five meetings a year—in February, April, June, October and December, and among the trophies of the club are the Bombay, the Glennie and the Photographic Society's Medals, the Adam, the Knill, the Singapore, the Calcutta and the Penn Cups, the Diamond Jubilee Cup and the Great Yarmouth Challenge Prize.

Golf had been played for 280 years on Blackheath before the county saw the institution of its next oldest inland course at Folkestone, where in 1888 a 9-hole course, about 2,700 yards in length, was laid out over the

meadows of Broadmead about a mile from the town. The greens are good, and there are plenty of hazards. The club possesses two valuable prizes in the Filmer-Bennett Cup and the Hong Kong Cup; the Captain's Gold Medal is offered for winners of the monthly medal.

The Barham Downs Golf Club, instituted in 1890, with a ladies' club attached, has its 9-hole course on the high chalk downs, where once stood Ingoldsby's gibbet, 4 miles from Canterbury, and half a mile from Bishopsbourne. It was founded by Captain Tattersall of Charlton Place near Canterbury, and has a length of about 4,800 yards. The hazards are made bunkers and a road which is crossed at the first three holes. Bogey for two rounds is an easy 77, which score has been beaten by Messrs. E. F. Morris and A. C. Edwards in 70 strokes. Harry Vardon has been round the 9 holes in 32. The club holds three meetings a year—in April, when the Style Challenge Cup is played for; in May, when the Captain's Prizes are the principal object for competition; and in September, when the Burdett Challenge Cup is offered.

The links of the Lamberhurst Golf Club, also instituted in 1890, are in the park at Court Lodge, 7 miles from Tunbridge Wells. The 9-hole course is about 1½ miles round, and the best months for play on this pasture land course are from March to June.

Sidcup has a 9-hole course opened in 1891, in which year the 18-hole links of the Rochester Golf Club were made on meadow land of sandy loam at Oakleigh, about 3½ miles from the cathedral city. The hazards are water, banks, fences and trees. The Rochester Club is rich in prizes, which include the Silver Iron, Lord Darnley's Cup, the Winch, the Oakleigh, the Atkin and the Royal Navy Cups, the Royal Scots Medal and the Royal Marine Shield. The professional record of 71 for the green was made by James Braid and R. F. Walker. Mr. W. A. Henderson and Mr. A. E. Bewes hold the amateur record of 74.

The year 1892 was the date of the foundation of the two powerful clubs of Bromley and Eltham, whose respective courses are on Bromley Common and in the park of Eltham Lodge. The Eltham course, where the hazards are artificial sand bunkers with a pond, hedges and ditches, has a length of 5,230 yards. It has been greatly improved of late years by an elaborate and costly system of drainage. The club-house is a magnificent old mansion, built in the reign of Charles II, formerly the residence of the Wood family.

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Tonbridge Golf Club, instituted in October 1893, has a sporting course of 9 holes situated between Tonbridge and Hildenborough. The club prizes include the Bent Cup, the Floyd Bowl, the Furley Cleek and the Lucas Iron. The President's Prize is played for in November.

The Chislehurst Golf Club, founded in 1894, has a somewhat short course in the park of Camden Place, where a record of 64 for the 18 holes has been established by Mr. O. C. Bevan and Mr. C. E. Dick. The beautiful and historic house of Camden Place is the club-house.

At Culverden and at Tunbridge Wells two courses were opened in 1896, that at Culverden being of 9 holes on high ground 500 feet above the town, while the links of the Tunbridge Wells club, also of 9 holes, are on quick-drying pasture with sandy subsoil close to the common. The ladies of the Tunbridge Wells club have a club-house of their own.

At Bearsted is the 18-hole course of the Maidstone Golf Club, instituted in 1897. Tickle's record of 73 and Mr. F. G. Stenning's of 75 for this undulating course testify to its sporting character. The Maidstone Ladies' Club, founded a year later, is a branch of the men's club.

The Dartford Golf Club, instituted in 1897, has a 9-hole course at Dartford Heath which has been greatly extended of late years. It is on old pasture-land with gravel subsoil, and has natural and artificial hazards of various kinds. The length is $1\frac{3}{4}$ miles with a par score of 39. The ground is never muddy, indeed it is apt to bake in hot and dry weather.

The Sundridge Park Golf Club has a fine inland course on Sir Samuel Scott's estate

close to Bromley, which was opened in 1901. It is a long 18-hole course laid out with excellent judgement over ground of very undulating character. The holes are of good length, and if there is a certain sameness about some of them the fine large greens, most of which are natural, the beautiful lies and the variety of the hazards more than atone for this.

Yet another of the many golf links in the neighbourhood of London is that of the Barnehurst Club. This is a somewhat short 18-hole course laid out by James Braid in 1903, in which year 9-hole courses at Ashford and Gravesend were opened. The Gravesend links are on the marshes between Gravesend and Higham, and are shortly to be lengthened to 18 holes.

The Eltham Warren Golf Club greatly enlarged its sporting links of 9 holes in 1904, and as the soil is dry and sandy the course is improving rapidly.

Youngest of Kent golf courses is the excellent one belonging to the Wrotham Heath Club, founded in 1906. The links are on Highlands Farm, Wrotham Heath, nearly 400 feet above the sea-level, and though there are only 9 holes, they are planned with such skill and are of such good length, the natural hazards are so interesting, and the turf, being on undulating ground throughout the course, is of such fine quality, that the club may be congratulated on its really fine course, which has every promise of becoming the very best of the inland courses in the county.

The Editor desires to express his cordial thanks to the secretaries of many clubs who have kindly supplied much of the information that is incorporated in these notes on golf in Kent.

ATHLETICS

The historian who sets himself the task of recording the story of Kent athletics finds at once that he has to deal with a county possessing peculiarities of its own with regard to this branch of sport; indeed, in one particular respect, Kent stands almost, if not quite, in a class by itself. Other counties have their amateur and their professional side of athletics, but in Kent the latter feature predominates to a much greater extent than can be found, probably, in any other part of the kingdom. Athletic sports, promoted under the laws and regulations of the Amateur Athletic Association, are comparatively few and far between, whereas

meetings of the unregistered type are numerous in almost every part of the county. The athlete who indulges in sport for sport's sake, which, as all must admit, is the healthiest form of recreation for mind and body that can be devised, would expect to find that in this part of England as elsewhere amateur gatherings held under the auspices of the A.A.A. were on the increase; but such unfortunately is not the case. It is to be noticed, indeed, that a number of meetings which were once of the unregistered type, and whose promoters tried the experiment of holding their sports under the aegis of the 'Three A's,' found

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the cost of the undertaking, including the payment of permit fees and the employment of official handicappers, far greater than they could bear, and they have long since reverted to the old order of things. The tendency to follow this example still exists. It seems likely that in the near future many more clubs will adopt the unregistered principle, while there appears to be little likelihood of new clubs coming forward to fill the gaps caused by these secessions from the ranks of pure amateurism. One cannot but regret this state of affairs, for strictly amateur athletics should everywhere form a part of the curriculum of the youth of England.

Other meetings of the long ago in the county of Kent, though still promoted under the laws of the Amateur Athletic Association, have either become less exclusive as regards the rules which govern them, or have gradually drifted into the hands of men with good ideas of sport but possessed of broader minds on the subject of amateurism and more democratic in their views. Belonging to this latter class of sports are those held at Belvedere, which meeting may be regarded as the successor to the old Erith and Belvedere fixture. No more popular gathering than this last within easy reach of London ever existed. In its palmy days in the early 'eighties it was loyally supported by the members of the London Athletic Club and similar bodies; but the character of the meeting has changed considerably since then, although it is still popular.

At about the same period there flourished meetings at Gravesend, at which athletes of good class were in the habit of competing. Prominent among the competitors of that day was E. C. Carter, a champion cross-country runner. He afterwards went to America, where he still remains, and in that country has won several championships and established records. At the old North Kent sports he was one of the most familiar figures, and on one occasion at that meeting he carried off the two miles open handicap in very fast time. At the same sports J. M. Cowie, the champion sprinter of the day, was credited with covering the 100 yards in a shade better than ten seconds. Whether he actually did so is open to some doubt, but the probability is that he achieved the record, for he was a good man and the course was a little downhill. At any rate his performance was a remarkable one, although it could not be officially recognized.

Shoreham sports, which at one time belonged to the unregistered category, came

within the fold of the Amateur Athletic Association a few years ago, and there seems to be every prospect of the Shoreham meeting one day taking a high position in Kent athletics. Dr. Desprez, one of the local officers of the A.A.A., is a resident in the district, and as becomes an old athlete, naturally interests himself greatly in the sport.

At Tunbridge Wells, a town ever associated with good men and true in nearly every branch of sport, a couple of sports meetings are held every year, the one by the Tonbridge Invicta Harriers, and the other by the Tunbridge Wells St. John's C.M. and A.C. Of the latter body Mr. H. Saville, of Newerman Road, Tunbridge Wells, is the honorary secretary. The old Tunbridge Wells Harriers, winners for a number of years of the South of the Thames inter-club race, are no longer in existence, although a number of their members—prominent among whom is A. Ovenden, of the London Athletic Club—are still to be met with, principally in the capacity of officials, at various athletic meetings both in and out of London.

Real athletics never flourished to any considerable extent in Kent, albeit as the county in which some important cycling contests have been decided under the auspices of the National Cyclists' Union, it has been rather famous in the past. To find anything of downright historical interest in Kentish field sports, apart from the fact that good men from other districts came to the county meetings, one has to come to the very modern times of 1887 to note that a Lewisham resident (but a Birmingham born man), J. H. Adams, carried off the 50 miles Ordinary Bicycle Championship of the N.C.U. at Birmingham. F. J. Osmond, S. F. Edge, and P. F. Wood, old cycle and tricycle champions, had their Kentish club and residential connexions, and the Crystal Palace itself has long been a home of cycle-racing. In 1892 the Herne Hill track was chosen for the N.C.U.'s chief races, and the Catford ground was used in 1896. A winner of a N.C.U. medal for the tandem championship in 1898 was F. Burnand of Catford, who partnered E. J. Callingham, a Surrey resident.

The Blackheath Harriers and Herne Hill Harriers are chiefly Kentish men, and while the former is rather an exclusive society, the latter can be said to have turned out some very useful runners within the past decade. For instance, the 15 miles amateur record holder, Fred J. Appleby, is a member of the H.H.H., and the ex-Irish mile and four miles champion, J. N. Deakin, bears the

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'hoops' of that club, as does F. H. Hulford, who has won the 4 miles A.A.A. championship. The quarter-mile champion of England in 1903, Chas. McLachlan, wore the colours of the Herne Hill contingent, which is so well looked after by Mr. Chas. Otway (Camberwell), their honorary secretary. The Blackheath Harriers have boasted a capital half-miler in B. J. Blunden, who has held English honours at that distance; and A. Healey, a fellow member, who ran second in the hurdle race at Athens, has won several Northern Counties championships by reason of his birth qualification.

Another club, the Kent A.C., brought into prominence A. Aldridge, a stayer who won Southern, National, and International honours on the flat and across country, though he always had to play second fiddle, when they met, to the Sussex wonder, Alfred Shrubbs. In the South-of-the-Thames Cross-Country championships Kentish clubs always figure prominently, and they won the last of the South-of-the-Thames races (1907) with a team of young and promising stayers.

Another club, the Cambridge Harriers, which to all intents and purposes is a London institution, belies its name so far as its membership is concerned, for most of its members are drawn from the county of Kent. The club was established in 1890.

Other athletic clubs within the county which hold their meetings under the laws of the Amateur Athletic Association are the Erith Harriers; Swanley C.M. and A.C.; Cray Valley C.M. and A.C.; Sittingbourne C.C.; Dover C.C.; Bexley W.M.C.; and Foots Cray C.C.

In addition to the sports meetings pro-

moted by these clubs, numerous gatherings are held annually, or at irregular intervals, in various parts of the county. Some are unregistered meetings mainly supported by amateur athletes, while others are avowedly of the professional order. Between these two kinds of meetings there is in reality a far greater difference than is recognized by the ruling body of the sport. But that Association tars both with the same brush and looks upon the unregistered meeting as disdainfully as it considers the purely professional undertaking. A hard and fast line must, however, be drawn somewhere, and severe as the regulations of the A.A.A. may appear to be in some instances, there is no doubt that their action is entirely in accordance with the best interests of those amateurs who are loyal to the provisions made by the laws of the predominant body.

Canterbury, Gravesend A.C., Northfleet Institute, Cliffe-at-Hoo, Rainham, Ramsgate, Birchington-on-Sea, Maidstone, Kent County Constabulary, Ashford United, Smeeth, Charing, Headcorn, High Halden, Chatham, Sittingbourne, Bexley Heath, and Orpington all hold sports every year—some of them in connexion with local flower shows—but it is impossible to say which of these are registered, unregistered or professional meetings, even if it were advisable to state the fact.

For a long time past, and indeed throughout the whole of its athletic career, although perhaps never more so than at the present time, Kent has been an unsettled county in the matter of its athletic principles, and the meeting that is registered to-day is more than likely to be unregistered, or even admittedly professional, to-morrow.



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